Globalisation, Domestic Political Institutions, and Climate Commitment and Performance

Inaugural-Dissertation zur Erlangung der Doktorwürde an der Fakultät für Philosophie, Kunst-, Geschichts- und Gesellschaftswissenschaften der Universität Regensburg

vorgelegt von
Romy Escher
geb. in Ludwigsburg

Regensburg 2020

Erstgutachterin: Prof. Dr. Melanie Walter-Rogg
Zweitgutachter: Prof. Dr. Stefan Wurster

Table of Contents

.

List of Abbreviations

AGO	Angola
ALB	Albania
ARE	United Arab Emirates
Art	Article
AUS	Australia
AUT	Austria
BDI	Burundi
BEL	Belgium
BFA	Burkina Faso
BGD	Bangladesh
BLR	Belarus
BOL	Bolivia
BRA	Brazil
C3-I	Climate change cooperation index
CAF	Central African Republic
CAIT	Climate data explorer
CAN	Canada
CCPI	Climate change performance index
CDIAC	Carbon dioxide information analysis center
CDM	Cooling degree months
CHE	Switzerland
CHN	China
CIV	Ivory Coast
CLIMI	Climate laws, institutions, and measures Index
CMR	Cameroon
CO_2	Carbon dioxide
COD	Democratic Republic of Congo
COG	Republic of Congo
COL	Colombia
CPI	Corruption perceptions index
CRI	Costa Rica
CUB	Cuba
CZE	Czech Republic
DEU	Germany
DJI	Djibouti
DNK	Denmark
DOM	Dominican Republic
DPI	Database for political institutions
DZA	Algeria
ECU	Ecuador
EDGAR	Emissions database for global atmospheric research system
EGY	Egypt
EIA	US energy information administration
EKC	Environmental Kuznets curve
ENGO	Environmental non-governmental organisation
ERI	Eritrea
ESP	Spain
EST	Estonia
ETH	Ethiopia
EU	European Union
FDI	Foreign direct investment
FIN	Finland
FJI	Fiji
FRA	France
fsQCA	Fuzzy-set qualitative comparative analysis
GAB	Gabon
GBR	United Kingdom
GDP	Gross domestic products
GEO	Georgia
GHA	Ghana
GIN	Guinea
GMB	Gambia
GNB	Guinea-Bissau
GRC	Greece
GTM	Guatemala
HDM	Heating degree months

HND	Honduras
HRV	Croatia
HUN	Hungary
ICRG	International country risk guide
IEA	International energy agency
IGO	International governmental organisations
IND	India
INGO	International non-governmental organization
IPCC	International panel of climate change
IRL	Ireland
IRN	Iran
ISR	Israel
ITA	Italy
JOR	Jordan
JPN	Japan
LAO	LAO
LBY	Libya
LKA	Sri Lanka
LTU	Lithuania
LVA	Latvia
KAZ	Zazakhstan
KEN	Kenya
KGZ	Kyrgyz Republic
KHM	Cambodia
KOR	South Korea
KWT	Kuwait
MAR	Morocco
MDA	Moldova
MEX	Mexico
MKD	Macedonia
MOZ	Mozambique
MRT	Mauritania
MUS	Mauritius
MYS	Malaysia
NGA	Nigeria
NGO	Non-governmental organization
NLD	Netherlands
NOR	Norway
NO_x	Nitrogen oxide
NPL	Nepal
NZL	New Zealand
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary least squares
OMN	Oman
PER	Peru
PNG	Papua New Guinea
POL	Poland
PRT	Portugal
PRY	Paraguay
QAT	Qatar
ROU	Romania
SAU	Saudi Arabia
SDN	Sudan
SEN	Senegal
SGP	Singapore
SLE	Sierra Leone
SLV	El Salvador
SO_2	Sulphur dioxide
SVK	Slovak Republic
SWE	Sweden
SWZ	Swaziland
TCD	Chad
TGO	Togo
THA	Thailand
TI	Transparency International
TJK	Tajikistan
TKM	Turkmenistan
TTO	Trinidad and Tobago
TUN	Tunisia

TUR	Turkey
TSCS	Time-series cross-sectional
TZA	Tanzania
ROU	Romania
RWA	Rwanda
UGA	Uganda
UKR	Ukraine
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
US/ USA	United States/ United States of America
V-Dem	Varieties of Democracy project
WDI	World Development indicators
WGI	World Governance Indicators
WTO	World Trade Organization
ZAF	South Africa

1 Introduction

Abstract

This study examines whether domestic political institutions moderate the influence of economic and political globalisation on climate commitment and climate performance. It makes four contributions to the literature. First, there has been no systematic research to date on the extent to which domestic political institutions moderate globalisation effects in comparative climate policy research. Instead, three research strands have addressed the joint effect of international integration and domestic political institutions within the broader globalisation literature. The veto-player approach assumes that both ideological heterogeneity among veto players and institutional constraints moderate the effect of globalisation. The political-corruption approach argues that corrupt political decision-makers and public officials affect the environmental consequences of international integration. The regime-type approach suggests that globalisation affects democracies and autocracies in different ways. The present study applies these perspectives to the analysis of climate commitment, as measured by UNFCCC and Kyoto Protocol ratification, and performance captured by CO_2 emissions. Its findings show that the veto-player approach cannot explain the relationship between globalisation, climate commitment, and performance. However, it does find support for the political-corruption and regime-type approaches. Second, this book contributes to the literature on the joint impact of globalisation and domestic political institutions on the environment. Previous research has focused on domestic pollution, arguing that governments formulating climate policy tend to react in similar ways to the pressures of international competition. The present analysis considers multiple dimensions of globalisation: economic openness, economic interdependence, and international political integration, captured by state involvement in international government organisations (IGOs). While countries may respond in similar ways to international economic pressures in order to stay competitive, domestic political institutions may moderate the scale effects of economic openness and the incentives derived from international political integration. The present findings indicate that the impact of economic interdependence on climate performance in developed countries is independent of veto players and political corruption. In addition, the regime-type and political-corruption approaches improve our understanding of the effect of economic openness on climate performance in developing countries. Aspects of regime type also moderate the effect of international political integration on climate commitment. Third, this study shows that a disaggregated analysis of the moderation effects of institutional explanatory factors can contribute to a better understanding of the climate consequences of globalisation. In addition to earlier research, which suggested that political corruption worsened the negative effects of economic openness, this analysis shows that the interaction effect is independent of the form of political corruption. While political globalisation affects UNFCCC ratification in different ways in democracies and autocracies, civil rights (in particular) strengthen the positive effect of state IGO involvement on Kyoto Protocol ratification. In relation to climate performance, civil rights also moderate the effects of trade and capital openness on developing countries. Finally, this study adds to the literature on treaty design and international cooperation. The interaction effects of regime type and IGO involvement on climate commitment vary in accordance with treaty design.

The consequences of climate change can already be observed (IPCC, 2015, p. 6) in melting polar ice and glaciers, sea-level rise, and intense heat waves (NASA, 2019, no page number). Climate scientists agree that global warming is taking place (IPCC, 2015, p. 5). The Intergovernmental Panel on Climate Change (IPCC) has concluded that it is '*extremely likely*' that global environmental change is being caused mainly by anthropogenic greenhouse gas emissions (IPCC, 2015, p. 5, emphasis in original),[1] which stem from combustion processes and deforestation. Most commentators agree that global warming is a challenge for society and the environment. Reducing global air pollution would change considerably our personal lives and the economy (Dauvergne, 2017, p. 409). Although climate change is a global environmental problem with global causes and consequences (Gleditsch & Sverdrup, 2002, p. 56), the international political system lacks a world government. For this reason, efforts to address the climate change problem rely on international cooperation (Dolšak, 2001, p. 415f.; Frankel & Rose, 2005, p. 89; Holzinger et al., 2008, p. 553f.).

However, several characteristics of the climate crisis make international cooperation difficult (see also Tubi et al., 2012, p. 472; Underdal, 2010). First, from the perspective of public goods theory, climate change can be regarded as a worldwide 'tragedy of the commons' (Hardin, 1968), i.e. a consequence of our overconsumption of the global

[1] More recent studies that support this conclusion include Haustein et al. (2019).

atmosphere (e.g., Bättig & Bernauer, 2009, p. 283; Dolšak, 2009, p. 554; Dolšak & Ostrom, 2003, p. 7; Harrison & Sundstrom, 2007, p. 1). Although the implications are spread unevenly, climate change mitigation is clearly in the long-term interest of all individuals and countries. However, to achieve and sustain their short-term interest in economic growth, citizens and governments must accept increases in greenhouse gas emissions (Dolšak, 2009, p. 51; Harrison & Sundstrom, 2010, p. 1; Vogler, 2008, p. 358). Moreover, sectors of the domestic economy that are harmed by reductions in global air pollution will mobilise against ambitious climate-protection policies (Dolšak, 2013, p. 384; Dolšak, 2009). The public good character of the global atmosphere implies that the use of this natural resource cannot be restricted. This enables governments to free-ride on the climate-protection efforts of other countries (Dolšak, 2013, p. 384; Dolšak, 2009, p. 551, 553; Dolšak, 2001, p. 415; Giddens, 2015, p. 158). Under the conditions of global economic competition, states have no interest in climate change mitigation (Bechtel et al., 2017, p. 1333). Second, the consequences of climate change are long term and will mainly affect future generations. This makes it less likely that political decision-makers will risk considerable short-term economic and political costs by forcing or implementing climate policies (Chayes & Chayes, 1991, p. 289; Held & Hervey, 2011, p. 102). Third, the costs and benefits of climate change mitigation vary among countries (Chayes & Chayes, 1991, p. 289; Dolšak, 2009, p. 552; Held & Hervey, 2011, p. 102). While developed countries face high costs, as they produce the largest share of greenhouse gas emissions, developing countries are more vulnerable to the consequences of global environmental change (Dolšak, 2009, p. 552). From a historical perspective, poor economies have contributed very little to global warming. Their governments therefore have little interest in implementing climate policies that will harm their economic development (Held & Hervey, 2011, p. 102). In sum, public good theory suggests that countries are unwilling to commit to climate cooperation or to implement measures to tackle global environmental change (Dolšak, 2009, p. 551; Harrison & Sundstrom, 2007, p. 1).

However, state responses to the climate crisis vary considerably among countries (Bättig & Bernauer, 2009, p. 283; Bernauer, 2013, pp. 433f.; Dolšak, 2001, p. 415; Holzinger et al., 2008, p. 554). Some countries, as well as regions and cities, are willing to accept ambitious greenhouse gas emissions targets and to take the lead on implementing climate policies (Brennan, 2009, p. 312). By contrast, other states decline to make binding commitments at the international level (here: climate commitment) and avoid adopting or implementing domestic climate change mitigation policies (here: climate performance). Public good theory alone cannot explain differences in the climate commitment and performance of different countries (Bättig & Bernauer, 2009, p. 283; Tubi et al., 2012, p. 472). The following question thus arises: what variables explain country differences in state participation in international efforts to tackle global warming? (Bättig & Bernauer, 2009, p. 283f.; Dolšak, 2013, p. 384; Dolšak, 2009, p. 552; Garmann, 2014, p. 1; Holzinger et al. 2008, pp. 553f.; Stadelmann-Steffen, 2011, p. 485). Comparative and global environmental policy researchers agree that both domestic and international explanatory factors influence climate commitment and performance (e.g., Jahn, 2016, p. 225).

In answer to the political recognition of global environmental change and the competitive pressures imposed by the world economy on governments and firms that encourage them to lower their environmental standards, social scientists, policymakers, and the public are currently debating the environmental consequences of globalisation[2] (Clapp & Dauvergne, 2011, pp. 19–46; Esty, 2011, p. 156). Is globalisation good or bad for our global environment? As greenhouse gas emissions result mainly from major economic activities (including transportation, production, resource extraction, agriculture, and deforestation) (Dauvergne, 2017, p. 409), the public debate focuses on the relationship between economic globalisation and climate change. Social science also examines the importance of international political integration in climate cooperation. Quantitative studies have reached ambiguous conclusions on the effects of economic and political globalisation on climate commitment and performance (see Chapter 3). Most studies have analysed the additive effects of globalisation, relative to domestic explanatory factors. The present study explores whether domestic political institutions moderate the effects of international economic and political integration on state participation in climate cooperation. As will be explained below, this study applies a broad understanding of domestic political institutions, considering both institutional constraints (e.g., veto points) and institutional quality (e.g., democracy quality aspects and forms of political corruption).

As Chapter 3 will discuss, most theoretical approaches in the globalisation/environment literature assume that domestic politics, including domestic political institutions, moderates the impact of international integration on (foreign) policy outputs (Chaudoin et al., 2015, p. 276; Wenzelburger & Neumann, 2015, 260f.; Zohlnhöfer, 2005). First, governments moderate state responses to international integration. Economic and political globalisation influence climate commitment and performance, acting as incentives and pressures on government behaviour. The ratification of climate treaties depends on the domestic political decision-making process, which is shaped by domestic political institutions (Congleton, 2002, p. 241; Dolšak, 2009, p. 556; Schulze, 2014, p. 116; Vogler, 2008, p. 353). State efforts to reduce greenhouse gas emissions also occur at country level. The same policy measures are used to reduce domestic and global pollution (Povitkina, 2018, p. 413). National governments are central political actors in the domestic adoption and implementation of climate-related and other policies that affect our

[2] This book treats the terms ‘globalisation’ and ‘international integration’ as synonyms.

global atmosphere (Barkdull & Harris, 2002, p. 64; Duit, 2014, p. 3; Gleditsch & Sverdrup, 2002, p. 57; Held & Hervey, 2011, p. 105; Holzinger et al., 2008, p. 554; McBeath & Rosenberg, 2006, p. 7). Second, domestic political institutions involved in implementing climate policies moderate the effect of globalisation on climate performance. Third, the government system, alongside domestic political institutions outside the government system, strengthens or weakens the impact of international incentives and pressures on climate commitment and performance. In this way, domestic political institutions influence a government's exposure to international influences.

> *'Decisions […] are in the end domestic political decisions, taken in the context of home-grown electoral interests, national discourses, and domestic political institutions' (Harrison & Sundstrom, 2007, p. 2).*

Finally, domestic political institutions moderate (as context conditions of international trade and investment) the effect of economic openness on climate performance via economic growth. It is therefore important to ask whether they make a difference to the relationship between globalisation and state participation in climate cooperation.

Race-to-the-bottom theory suggests that the effects of international integration are independent of domestic political institutions. Governments reduce their environmental standards to stay competitive. For this reason, Cao and Prakash (2012) have focused on domestic pollutants. While, to stay competitive, countries may react in similar ways to pressures related to economic globalisation, this study argues that institutional explanatory factors may still moderate the growth effects of economic openness, as well as the incentives derived from international political integration, on state participation in climate cooperation. Moreover, there may be differences between climate commitment and performance. Despite the pressure of economic competition, states may ratify climate treaties in response to positive incentives related to domestic politics and international political integration, without intending to actually implement them. Few quantitative studies have considered the possible interaction effects between domestic and international explanatory factors in climate performance (e.g., Chang, 2015; Perkins & Neumayer, 2012; Ruoff, 2009; Spilker, 2013). Interaction effects between globalisation and domestic politics, in relation to state participation in climate cooperation, have never been systematically analysed (Bernauer, 2013, p. 436; Purdon, 2015, p. 15; see also Cao & Prakash, 2012, p. 67 on environmental policy in general).

> *'While research into climate change politics increasingly engages the classic repertoires of comparative politics and public policy, it remains necessary to (re)think how international and domestic politics interact' (Purdon, 2015, p. 15).*

The broader literature on the policy consequences of globalisation has shown that domestic political institutions make a difference in the relationship between international integration and public policy (e.g., Garrett 1998; Ha, 2008; Rudra, 2002; Rudra & Haggard, 2005). The present study intends to fill this research gap. This chapter specifies the research question (1.1), explains its relevance (1.2), and summarises this book, chapter by chapter (1.3).

1.1 Specification of the research question

Do the effects of globalisation on state participation in international climate cooperation depend on domestic political institutions? The following section explores this research question. State participation in international climate-protection efforts is here defined as a commitment to the central goals and principles of the UN climate change regime (climate commitment) and the adoption and implementation of measures to mitigate climate change (climate performance) (see Chapter 2). In considering state participation in international climate cooperation, this study restricts the dependent variable to one aspect of a country's overall climate policy. As explained above, collective action by a large number of countries is needed to tackle global warming (Brennan, 2009, p. 310; Gleditsch & Sverdrup, 2002, p. 56). It is therefore essential to study country differences in climate cooperation. Furthermore, as global warming is a 'tragedy of the commons' (Hardin, 1968), which cannot be solved without considerable costs, it constitutes a hard test for the hypothesis that globalisation and domestic political institutions jointly influence environmental protection efforts (Bättig & Bernauer, 2009, p. 292). The present study specifies the dependent variable as state participation within the United Nations (UN) climate change regime (UNFCCC, United Nations Framework Convention on Climate Change), as it is the only global approach to coordinate state behaviour to tackle global warming[3].

Both dimensions of climate cooperation are examined. As Chapter 2 will explain, commitment to the central goals and principles of climate cooperation is captured through the ratification of UN climate treaties. The focus of this study on UNFCCC and Kyoto Protocol ratification reflects the availability of data.[4] Climate performance is conceptualised using climate policy outcomes[5] and measured by carbon dioxide (CO_2) emissions. Previous studies of

[3] Giddens (2015, pp. 159f.) argues in favour of regional and bilateral cooperation with countries such as Brazil, China, and India, as the climate crisis cannot be solved without them. He argues that the UN is too weak to enforce climate change mitigation.

[4] Data for all relevant independent variables are available up to 2006.

[5] This book treats the terms 'climate policy outcome' and 'climate outcome' as synonyms.

the joint effect of globalisation and domestic political institutions have focused on climate performance (e.g., Spilker, 2013). To date, no similar publication has investigated climate commitment. However, the definition of climate cooperation requires states to agree on common goals and principles *and* implement policy measures to enact them. For this reason, it is relevant to study how globalisation affects both dimensions of climate cooperation. This book investigates climate commitment and performance separately. As previously mentioned, the ratification of climate treaties does not necessarily imply that governments also reduce their greenhouse gas emissions. States have different motivations for joining climate treaties and reducing greenhouse gas emissions. Moreover, in contrast to the ratification of international agreements, climate policy outcomes are influenced by factors beyond government behaviour. The literature shows that the relative importance of explanatory factors varies between climate commitment and performance (e.g., Bättig & Bernauer, 2009). It is therefore important to investigate whether globalisation affects climate commitment and performance in different ways. For example, states may be more likely to ratify climate treaties in response to incentives derived from IGO involvement than to reduce climate change. Simultaneously, competition concerns may have more impact on climate performance than on climate commitment. It is also relevant to explore whether domestic political institutions influence globalisation effects in both climate-cooperation dimensions. Researchers must compare domestic and international explanatory factors in both dimensions of state participation in climate cooperation. Domestic political institutions may have more influence on climate commitment than on climate performance. It is easier for countries to ratify climate treaties in response to ENGO influence and incentives derived from international political integration, than to mitigate climate change. The costs are lower and the issue visibility of ratification behaviour is higher. It is harder for citizens and ENGOs to monitor the impact of economic globalisation on climate policy outcomes.

In relation to economic and political globalisation, the research question focuses on international factors that help to explain climate commitment and performance. Two categories of possible international determinants can be distinguished: the impact of state linkages with the international system (e.g., the distribution of power within the international system) (Cohen, 2002, p. 432; Oatley, 2011, p. 312; Waltz, 1959, pp. 159f.) and linkages between countries (Cao & Prakash, 2012, p. 68; Oatley, 2011, p. 313). In the case of globalisation, this study focuses on the latter. Following previous comparative climate policy research, it examines international economic and political integration. Two conceptualisations of the former are considered: economic openness (trade and capital openness) and economic interdependence, conceptualised as policy diffusion via important trading partners. This study argues that the moderation effects of domestic political institutions should vary between economic openness and policy diffusion. Irrespective of institutional differences, countries may react in similar ways to competition pressures. Domestic political institutions may, however, influence the growth effects associated with economic openness. In line with previous research, international political integration is here conceptualised as state involvement in international government organisations (IGOs) (see Chapter 3).[6]

Domestic influences on policy outputs and outcomes result from processes within the country (Waltz, 1959, p. 81). This study investigates the importance of domestic political institutions, exploring the extent to which domestic politics influence the effect of globalisation. Focusing on institutional variables makes it possible to examine countries worldwide. The availability of data on the policy preferences of political decision-makers outside the developed world is limited. Three research strands within the literature address the joint effect of globalisation and domestic political institutions on (environmental) policy. The veto-player approach argues that ideological heterogeneity among veto players and institutional constraints (veto points) moderate the effect of international integration. The political-corruption approach assumes that levels of corruption among political decision-makers and public officials impact the consequences of international integration. Finally, the regime-type approach assumes that effect of globalisation differs between democracies and autocracies. The underlying understandings of domestic political institutions vary among these explanatory approaches. While the veto-player approach focuses on institutional constraints, the political-corruption and regime-type approaches consider aspects of institutional quality. Accordingly, this study applies a broad understanding of domestic political institutions, considering institutional constraints and quality. Chapters 4 and 5 will detail the domestic political institutional variables of the three explanatory factors. To answer the research question, this study applies these perspectives to an analysis of climate commitment and performance, asking the following question: Are the effects of international economic and political integration on climate commitment and performance dependent on the policy preferences of veto players, veto points, political corruption and/or regime type?[7] As far as possible, the study examines the rules in use in relation to domestic political institutions.[8] The veto-player approach makes it possible to consider the policy preferences of veto players. The database limits the analysis of these factors in countries outside the developed world.

[6] Moreover, data availability restricts the focus on state involvement in IGOs (see Chapter 3). The final chapter discusses additional dimensions of globalisation, which should be considered in future research.

[7] The regime type is only applied in the pooled analysis and in the separate analysis of developing countries.

[8] Data availability partly restricts this analysis of the veto-player approach to rules of law.

Finally, this study examines both developing and developed countries[9]. While this classification is too simplistic to account for the development level of countries worldwide[10] (Farias, 2019; Tezanos Vázquez & Sumner, 2013), it is relevant to analysing climate cooperation. First, there are legal differences between these two country groups. The UN climate change regime regards rich countries as historically responsible for global warming. By contrast, poor economies were expected to focus on their own development during the research period (1992-2006). Governments also use the developing/developed classification system to shape foreign policy identity (e.g., Farias, 2019). Some countries retain developing-country status in the climate change regime because it gives them an advantage (e.g., Turkey). Second, greenhouse gas emissions are higher in high-income countries, where the industrialisation process began earlier. The climate performance of these two groups should therefore be studied separately. This book examines both developed and developing countries. From a historical perspective, global warming has been caused by industrialised countries. However, it is relevant to study the participation of developing countries in climate cooperation as well. From a social-science perspective, the level of economic development alone cannot explain country differences in environmental policies (Spilker, 2013, p. 1). From a policy perspective, poor economies must be included to solve the climate change problem (Lederer, 2017, pp. 1107f.). In fact, most CO_2 emissions now come from the developing world (CGDEV, 2015, no page number). For instance, Brazil and China have higher per-capita emissions than some developed countries (Lederer, 2014, p. 327). For the reasons detailed above, this book studies developed and developing countries separately, whenever possible. Globalisation can be assumed to affect climate commitment and performance in different ways in the two groups; in addition, climate treaties define different obligations for countries in the two groups. The industrialisation process began earlier in rich countries than in poor ones. Rich countries, therefore, have historically higher levels of global air pollution.

To conclude, this book investigates whether effects of economic and political globalisation on climate commitment and performance depend on the policy preferences of veto players, veto points, political corruption, and/or regime type. It develops explanatory models of climate commitment and performance for the veto player, political corruption, and regime-type approaches, using these to formulate hypotheses for an empirical analysis. It conducts survival and OLS regression analyses to examine climate commitment and performance. Given the lack of variation in the ratification behaviour of developed countries, the analysis of climate commitment explores the pooled sample of all countries, as well as separately investigating developing countries. Climate performance is analysed separately for developed and developing countries. As the developed-country sample consists only of democracies, hypotheses related to climate performance are tested only on the developing-country sample with the regime-type approach.

1.2 Contributions to the literature

The analysis of possible interaction effects between domestic political institutions and globalisation is relevant from a scientific as well as a policy perspective. Former UN general secretary, Ban Ki Moon, called global warming the greatest challenge facing humankind (Hance, 2009, no page number). More recently, Michelle Bachelet, the UN rights chief, described climate change as a 'never seen threat to human rights' (see AFP, 2019, no page number). From a policy perspective, it is important to understand country differences in the willingness and ability of governments to tackle climate change (Bernauer, 2013, p. 434; Cao et al., 2014, p. 293). It particularly important to establish the extent to which domestic factors moderate the globalisation/global warming relationship. Policymakers and interest groups argue that the state is powerless under conditions of economic globalisation (Jänicke, 1998, p. 343). According to Frankel and Rose (2005, p. 85), when international trade contributes to environmental degradation, independent of other factors, there is little public demand to reduce globalisation to protect the environment.

This study makes four contributions to the academic literature. To date, there has been no systematic research on this research question in the comparative climate-policy literature. Early International Relations scholars focused on international factors to explain climate commitment (e.g., Young, 1997) (Paarlberg, 1997, p. 149; Sussman, 2004, p. 351). Quantitative studies in the field of comparative environmental policy research focused on domestic determinants (e.g., Scruggs, 2003). In accordance on the assumption made in comparative policy and comparative foreign-policy theory – that policy outputs are determined by international and domestic variables (Bernauer et al., 2010, p. 509; Chaudoin et al., 2015, p. 275; Dolšak, 2001, p. 416; Jahn, 2016, p. 225; Zohlnhöfer, 2016, p. 225) – recent comparative climate policy research has considered both (Jahn, 2016, p. 225). This study is the first to

[9] The terms 'developed', 'industrialised', 'rich' and 'high-income countries/economies' are used as synonyms in this book. The same applies to 'developing' and 'poor countries/economies'.

[10] First, there are considerable differences within developed and developing countries (Farias, 2019). Second, there are poor countries that perform with regard to at least some aspects of socio-economic development better than high-income countries and a decline in economic equality in the developed world can be observed (Farias, 2019).

contribute to comparative climate policy research by studying the possible interaction effects of domestic and international explanatory factors. This analysis of the moderation effects of globalisation and domestic political institutions could contribute to a better understanding of climate commitment and performance (Beeson, 2018, p. 35; Cao & Prakash, 2012; Graham et al., 2012, p. 696).

> *'It is fruitless to debate whether domestic politics really determine international relations, or the reverse. 'Both sometimes.' The more interesting questions are 'When?' and 'How?'' (Putnam, 1988, p. 427).*

Accordingly, Bernauer (2013, p. 434), Cao and Prakash (2012, p. 67), and Purdon (2015, p. 15) argue that comparative climate policy research should consider the moderation effects of domestic variables on international influences. Few studies have examined the interaction effects of international integration and domestic political institutions on climate performance. Spilker (2013) has shown that regime type does not moderate the effect of trade openness on CO_2 emissions in developing countries. In another study, Ruoff (2009) found no interaction between international political integration and democracy quality in relation to climate performance in the developing world. Chang (2015) has demonstrated that trade openness is associated with an increase in CO_2 emissions in corrupt countries. Existent research on the present research question has focused on climate performance. By contrast, this study examines climate commitment *and* performance. The literature suggests that domestic and international explanatory factors affect climate commitment and performance in different ways (see Chapters 3 & 4). This book argues that the same is true of their joint effect. With regard to the regime-type approach, this study argues that, as climate change mitigation is associated with considerable costs, international political integration is unlikely to contribute to climate performance in either democracies or autocracies. By contrast, regime-type differences (which increase countries' openness to incentives derived from international political integration) are likely to impact its influence on climate commitment. Finally, in contrast to previous research, this study examines simultaneously the veto player, political corruption, and regime-type approaches to the joint effect of globalisation. Similar research has focused on specific institutional variables. The present study shows that the veto-player approach cannot explain the relationship between globalisation, climate commitment, and performance. The policy preferences of veto players in the left/right dimensions are unlikely to influence the effect of globalisation on climate commitment or performance. Left- and right-wing parties both want their domestic economies to be competitive. However, the political-corruption and regime-type approaches improve our understanding of the effects of economic openness and political integration on climate commitment and performance.

Second, this study complements the broader literature on the joint effects of globalisation and domestic political institutions on the environment. It considers multiple dimensions of globalisation: economic openness and interdependence and international political integration. Jahn and Stephan (2015, p. 18), as well as Franzese and Hays (2008, p. 752), emphasise that the non-inclusion or inadequate conceptualisation of international integration will result in omitted-variable bias. The following analysis assumes that the moderation effects of domestic political institutions and globalisation can vary between economic and political globalisation. Previous research (e.g., Cao & Prakash, 2012) has focused on analysing the joint effects of domestic political institutions and economic interdependence on domestic environmental problems, based on the assumption that climate change has no immediate impact on citizens, leading governments to react in similar ways to international pressures to stay internationally competitive. The present study argues that, while countries respond in similar ways to international economic pressures to stay competitive (economic interdependence), domestic political institutions have more influence on international political integration and the economic-growth effects of economic openness. Accordingly, the effect of policy diffusion among trading partners is independent of political institutions. By contrast, regime type moderates the effect of international political integration on climate commitment. The regime-type and political-corruption approaches improve our understanding of the effect of economic openness on climate performance in developing countries.

Third, this study contributes to research on the joint effects of globalisation and domestic political institutions by examining the possible moderation effects of veto points, forms of political corruption, and regime type at a disaggregated level. The academic literature suggests that specific veto points, political-corruption dimensions, and democracy-quality dimensions cannot be expected to have uniform effects on climate commitment and performance. The present study argues that this is also relevant to their joint effect with globalisation on climate commitment and performance. From a theoretical perspective, the potential moderation effects of specific veto points, such as a presidential veto player, bicameralism, or government fragmentation, are ambiguous and must therefore be examined separately. The political-corruption/environment literature distinguishes between forms of political corruption. From a theoretical perspective, it is unclear whether general political corruption or specific forms of political corruption (e.g., executive, legislative, or public sector corruption) moderate the effect of international integration. In line with the results of Spilker (2013), there may be no general difference between democracies and autocracies in the effect of trade openness on climate commitment and performance. However, specific democratic qualities, such as political and civil rights, may strengthen positive incentives derived from political globalisation to encourage the ratification of climate treaties. Such democratic freedoms also make a country attractive for domestic and foreign investment. They can therefore be expected to undermine climate performance via economic

growth. The present findings show that a disaggregated analysis of regime type, in particular, contributes to a better understanding of the interaction effects between globalisation and domestic political institutions.
Finally, this study adds to the literature on treaty design and climate cooperation. The literature suggests that treaty design matters for the ratification of climate agreements (e.g., Bernauer et al., 2013; Spilker, 2013). It should likewise affect the interrelationship between globalisation and domestic political institutions. Few costs are associated with ratifying the UNFCCC. The Kyoto Protocol encompasses legally binding emissions reduction targets for developed countries; it has been contested among developing countries as well. Democracies and autocracies can be assumed to differ systemically, when it comes to the relationship between international political integration and ratifying the UNFCCC. It is an empirical question whether the positive effect of political globalisation is stronger in democracies or autocracies. Democracies are more open to international influences. Autocracies may join IGOs and ratify climate treaties to improve their international reputations. With regard to the Kyoto Protocol, there is no general difference between democracies and autocracies. Yet, as previously mentioned, the positive effect of international political integration on Kyoto Protocol ratification may be stronger in countries with above-average levels of political and civil rights. These democratic qualities enable ENGOs to pressure the government, reflecting a country's acceptance of the rule of law. The findings of this study confirm that IGO involvement contributes in autocracies and to Kyoto Protocol ratification in countries with above-average levels of civil rights.

1.3 Chapter by chapter summary

In response to research question, **Chapter 2** explains the conceptualisation and measurement of the dependent variable. First, the joint influence of globalisation and domestic political institutions must be studied separately in relation to different environmental problems. Political decision makers have fewer incentives to tackle global warming than local environmental problems (such as local air pollutants, including nitrogen oxides, NO_x; sulphur dioxide, SO_2). However, it is an empirical question whether domestic political institutions matter to the relationship between globalisation and climate protection. As a solution to the climate crisis depends on international coordination, this study focuses on state participation in climate cooperation. The dependent variable is defined as commitment to the central goals and principles of the UN climate change regime (climate commitment) and implementing measures that contribute to its central goal: the stabilisation of greenhouse gas emissions (climate performance). Climate commitment is measured through ratification of the two treaties that fall into the 1992–2006 research period: the UNFCCC and the Kyoto Protocol. Climate performance is captured, based on the concept of environmental performance, through CO_2 emissions. Second, it is important to examine climate commitment and performance separately, as previous studies have shown that explanatory factors vary. In contrast to reductions in CO_2 emissions, climate treaties can be ratified at little cost. This should be an important factor in the interrelationship of domestic and international variables as well. Third, the literature on treaty design and international cooperation suggests that the relative importance of domestic and international factors that explain climate commitment vary in accordance with treaty design. This study contributes to the literature by examining the joint effects of domestic political institutions and globalisation separately for UNFCCC and Kyoto Protocol ratification. The latter treaty is more challenging for developed countries because it incurs higher costs (e.g., legally binding greenhouse gas emissions reduction targets) than the former. Finally, differences between developed and developing countries should be considered when analysing the possible moderation effects of domestic political institutions. The two climate treaties define different obligations for developed and developing countries. Moreover, the industrialisation process began earlier in rich countries than in poor ones. The former therefore have higher levels of global air pollution.
To formulate hypotheses on interaction effects, it is necessary to specify the causal order of domestic and international explanatory factors of climate commitment and performance. **Chapter 3** begins by examining the relationship between international integration, climate commitment, and performance. Is globalisation good or bad for climate commitment and performance? How does globalisation affect state participation in climate cooperation? The theoretical and empirical literature suggests that economic openness undermines climate performance in poor economies through the scale and composition effects of economic growth, and that international political integration contributes via positive incentives to climate commitment and performance. In the developed world, economic globalisation has a particular influence on climate outcomes via policy diffusion among trading partners.
Second, Chapter 3 explains this study's contribution to the academic literature. Are the effects of economic and political globalisation dependent on domestic political institutions? Most theories underpinning arguments that link international integration to climate commitment and performance assume that domestic political institutions moderate the effect of international integration. The central argument of this chapter is that it must be determined empirically whether the effect of globalisation on climate commitment and performance is independent of domestic factors. While domestic political institutions may not impact competition pressures, the interaction effects between international integration and domestic political institutions may vary among globalisation dimensions. Moreover, institutional constraints and institutional quality do not simply influence government responses to

globalisation, they also moderate the indirect effects of economic openness via economic growth. Previous empirical explanatory models of climate commitment and performance have assumed additive effects of international integration. Based on the broader globalisation literature, this chapter distinguishes between three research traditions involving the joint effect of globalisation and domestic political institutions: veto player theory, the joint influence of globalisation and political corruption, and the joint influence of the globalisation and regime type. They share the assumption that institutional constraints and quality matter to the relationship between globalisation and policy output and outcome. To contribute to the globalisation/environment literature, this study examines whether these perspectives apply to climate commitment and performance.

To identify the role played by domestic institutional factors in the causal process discussed in Chapter 5, **Chapter 4** examines the literature on veto players, political corruption, regime type, and climate commitment and performance. This chapter argues that it is important to analyse the effect of veto players, political corruption, and regime type on climate commitment and performance at a disaggregated level. As the following chapter explains, this is also important for analysing the joint influence of globalisation and domestic political institutions. The veto-player approach discusses the importance of ideological heterogeneity among veto players and government ideology, as well as veto points for climate commitment and performance. There is no agreement on whether specific veto points have uniform effects (government fragmentation, presidentialism, and bicameralism/federalism). While the literature assumes that the political corruption of political decision-makers and public officials undermines the ratification of climate treaties and efforts to reduce greenhouse gas emissions, their relative importance is unclear. Finally, while democracies and autocracies are likely to differ systemically in their ratification of soft international treaties, such as the UNFCCC, no uniform effect of democratic quality dimensions (vertical and horizontal accountability, political and civil rights) on Kyoto Protocol ratification and climate performance can be assumed.

To specify the causal order of domestic and international explanatory factors, based on the conclusions of the previous two chapters, **Chapter 5** first partly reformulates Wenzelburger and Zohlnhöfer's (2015) explanatory model, transferring it to climate commitment and performance. The following sections specify the basis for explanatory models of the joint influence of globalisation and veto players/political corruption/regime type and formulate hypotheses for the empirical analysis.

With regard to climate commitment, regime type is assumed to matter to the relationship between international political integration and UNFCCC and Kyoto Protocol ratification. However, there may be differences between the two treaties. Democracies and autocracies are likely to differ systemically with regard to the effect of international political integration on UNFCCC ratification. Ratifying the UNFCCC involves few costs. It is an empirical question whether democracies or autocracies ratify soft climate treaties faster. There is unlikely to be a systemic difference between democracies and autocracies in the effect of international political integration on the ratification of the harder Kyoto Protocol. However, political and civil rights, together with international political integration, may contribute to Kyoto Protocol ratification.

This study assumes that ideological heterogeneity among left- and right-wing veto players makes little difference in the relationship between economic globalisation and climate performance. Left- and right-wing parties care about the competitiveness of the domestic economy. There is little reason to expect domestic political institutions to moderate the effects of economic interdependence on climate outcomes in the developed world. Independent from institutional difference, governments should consider competition concerns. It is an empirical question whether specific veto points moderate the effect of economic globalisation. By contrast, in developing countries, political corruption, as well as political and civil rights, is likely to moderate the scale effects of economic openness on climate performance. It is unclear, from a theoretical perspective, whether the negative effects of economic openness are stronger or weaker in countries with high levels of political corruption and political and/or civil rights. On the one hand, political and civil rights should weaken the negative effects of international trade and investment. Political rights enable citizens and ENGOs to pressure the government and business actors to consider environmental protection. Civil rights allow them to use courts to demand that environmental regulations be implemented. On the other hand, political and civil rights may undermine climate performance via economic growth because they make a country more attractive for trade and investment. The interrelationship between political corruption and economic openness is also theoretically ambiguous. Corrupt political authorities and public officials may strengthen the negative effects of economic openness because it hinders the adoption and implementation of environmental policies. Simultaneously, it undermines a country's attractiveness for trade and investment.

The research design is explained in **Chapter 6**. As this study is interested in explaining cross-national variations in climate commitment and performance, it adopts a macro-comparative approach. The first section explains the research period and case selection. The second section describes the measurement of the main independent variables. To ascertain the relative importance of the interrelationship between international integration and domestic politics, statistical analyses control additional economic, natural, political, and social variables that have been applied in similar studies. This chapter therefore formulates control hypotheses based on the academic literature. The criteria used to measure the independent variables were data availability and data comparability, in addition to validity and reliability. The final section summarises the treatment of missing values.

Is globalisation good or bad for climate commitment and performance? Is its effect independent of domestic political institutions? **Chapters 7 and 8** carry out a survival analysis and OLS regression analysis respectively to examine climate commitment and performance. In accordance with the theoretical expectations, globalisation and its interplay with domestic political institutions affects climate commitment and performance in various ways. While international economic integration has no effect on the ratification of climate treaties, IGO involvement contributes to climate commitment. As expected, the statistical analysis offers no support for the veto-player or political-corruption approaches. However, regime type does moderate the effect of international political integration on climate commitment. In accordance with the hypotheses, the joint effect of regime type and state involvement in IGOs varies between UNFCCC and the Kyoto Protocol. IGO involvement contributes only in autocracies to UNFCCC ratification. This finding confirms previous research on the ratification of soft human-rights treaties. Autocracies join IGOs and soft international agreements to improve their reputations at the international level. As expected, there is no systemic difference between democracies and autocracies when it comes to the relationship between international political integration and Kyoto Protocol ratification. However, civil rights strengthen the positive effect of state involvement in IGOs on Kyoto Protocol ratification. Countries that accept the rule of law at the domestic level ratify the Kyoto Protocol faster. The statistical analysis finds no support for the hypothesis that political rights matter to the relationship between international political integration and Kyoto Protocol ratification. These results illustrate the importance of considering aspects of regime type when analysing international political integration and climate commitment. Moreover, they contribute to the literature on treaty design and international cooperation. The joint effects of domestic and international explanatory factors vary in accordance with treaty design.

Confirming theoretical expectations, the findings suggest that climate performance in developed countries depends on the climate outcomes of important trading partners. As expected, this effect is independent of veto players and forms of political corruption. However, international political integration contributes to climate performance in bicameral developed countries. A short case study of the United States investigates this relationship in more detail. Among globalisation dimensions, only trade and capital openness are associated with the climate performance of developing countries. As expected, among globalisation dimensions, economic openness is crucial for climate outcomes in developing countries. As earlier research has shown, political corruption worsens the negative effect of international trade on climate performance. This study makes the point that this effect is independent of the form of political corruption. In accordance with theoretical expectations, civil rights moderate the effect of economic openness on climate outcomes. Civil rights weaken the negative consequences of international trade. Simultaneously, capital openness contributes to climate performance in countries with below-average civil-rights values but undermines climate performance in countries that perform relatively well in these democratic-quality dimensions. This supports the hypothesis that civil liberties increase via the attractiveness to foreign investment scale effects of international trade on CO_2 emissions. The paradoxical finding of this study – that these freedom-related rights strengthen the positive effects of international political integration on climate commitment and strengthen the negative effects of economic openness on climate performance – is explained using Bolivia as a case study.

Overall, this book shows that political globalisation contributes to climate commitment and supports climate performance in the developed world. Economic globalisation influences climate outcomes in developed countries via economic interdependence, and in developing countries via economic openness. Apart from the relationship between economic interdependence and climate outcomes in rich countries, the effects of globalisation are moderated by domestic political institutions. However, interaction effects vary among globalisation dimensions, between climate commitment and performance, in relation to treaty design, and between developed and developing countries. The results support hypotheses based on political-corruption and regime-type approaches. By contrast, there is little support for the veto-player approach. A disaggregated analysis of institutional variables improves our understanding of the moderation effects of regime type. The final chapter (**Chapter 9**) compares findings related to climate commitment and performance, explains their contributions to the literature, and discusses the study limitations, policy implications, and opportunities for future research.

References

AFP (Agence France-Presse). 2019. Climate crisis is greatest ever threat to human rights, UN warns. https://www.theguardian.com/law/2019/sep/09/climate-crisis-human-rights-un-michelle-bachelet-united-nations. *The Guardian*. Accessed 9 Aug 2019.

Barkdull, John, and Paul G. Harris. 2002. Environmental change and foreign policy: A survey of theory. *Global environmental politics* 2(2):63–91.

Bättig, Michèle B., and Thomas Bernauer. 2009. National institutions and global public goods: Are democracies more cooperative in climate change policy? *International Organization* 63(2):281-308.

Bechtel, Michael M., Frederica Genovese, and Kenneth F. Scheve. 2017. Interests, norms and support for the provision of global public goods: The case of climate co-operation. *British Journal of Political Science* 49(4):1333–1355.

Beeson, Mark. 2018. Coming to terms with the authoritarian alternative: The implications and motivations of China's environmental policies. *Asia & the Pacific Policy Studies* 5(1):34–46.

Bernauer, Thomas. 2013. Climate change politics. *Annual Review of Political Science* 16(1): 421–448.

Bernauer, Thomas, Anna Kalbhenn, Vally Koubi, and Gabriele Spilker. 2010. A comparison of international and domestic sources of global governance dynamics. *British Journal of Political Science* 40(3): 509–538.

Bernauer, Thomas, Anna Kalbhenn, Vally Koubi, and Gabriele Spilker. 2013. Is there a "depth versus participation" dilemma in international cooperation? *The Review of International Organization* 8(4):477–497.

Brennan, Geoffrey. 2009. Climate change: a rational choice politics view. *Australian Journal of Agricultural and Resource Economics* 53(3):309–326.

Cao, Xun, Helen V. Milner, Aseem Prakash, and Hugh Ward. 2014. Research frontiers in comparative and international environmental politics. *Comparative Political Studies* 47(3):291–308.

Cao, Xun, and Aseem Prakash. 2012. Trade competition and environmental regulations: Domestic political constraints and issue visibility. *The Journal of Politics* 74(1):66–82.

CGDEV (Center for Global Development). 2015. Developing countries are responsible for 63 percent of current carbon emissions. https://www.cgdev.org/media/developing-countries-are-responsible-63-percent-current-carbon-emissions. Accessed 13 Nov 2019.

Chang, Shu-Chen. 2015. The effects of trade liberalization on environmental degradation. *Quality & Quantity* 49(1):235–253.

Chaudoin, Stephen, Helen V. Milner, and Xun Pang. 2015. International systems and domestic politics: Linking complex interactions with empirical models in international relations. *International Organization* 69(2):275–309.

Chayes, Abram, and Antonia H. Chayes. 1991. Adjustment and compliance processes in international regulatory regimes. In *Preserving the global environment. The challenge of shared leadership*, ed. Jessica Tuchman Mathews, 280-308. New York & London: W.W. Norton & Company.

Clapp, Jennifer, and Paul Dauvergne. 2011. Paths to a green world. The political economy of the global environment. Second edition. Cambridge & London: The MIT Press.

Cohen, Benjamin J. 2002. International finance. In *Handbook of international relations*, eds. Walter Carlsnaes, Thomas Risse, and Beth A. Simmons, 429–447. London et al.: Sage Publications.

Congleton, Roger D. 2002. Governing the global environmental commons: The political economy of international environmental treaties and institutions. In *International environmental economics. A survey of the issues*, eds. Günther Schulze, and Heinrich W. Ursprung, 241–263. Oxford: Oxford University Press.

Dauvergne, Peter. 2017. The political economy of the global environment. In *Global political economy*. 5th edition, ed. John Revenhill, 387–414. Oxford: Oxford University.

Dolšak, Nives. 2001. Mitigating global climate change: Why are some countries more committed than others? *Policy Studies Journal* 29(3):414–436.

Dolšak, Nives. 2009. Climate change policy implementation: A cross-sectional analysis. *Review of Policy Research* 26(5):551–570.

Dolšak, Nives. 2013. Climate change policies in the transitional economies of Europe and Eurasia: The role of NGOs. *Voluntas* 24(2):382–402.

Dolšak, Nives, and Elinor Ostrom. 2003. The commons in the new millennium. Cambridge & London: The MIT Press.

Duit, Andreas. 2014. Introduction: The comparative study of environmental governance. In *State and environment. The comparative study of environmental governance*, ed. Andreas Duit, 1–24. Cambridge (MA) & London: MIT Press.

Esty, Daniel C. 2011. Economic integration and environmental protection. In *The global environment. institutions, law, and policy*. Third Edition, eds. Regina S. Axelrod, Stacy D. VanDeveer and David Leonard Downie, 155–171. Washington: CQ Press.

Farias, Déborah B. L. 2019. Outlook for the 'developing country' category: a paradox of demise and continuity. *Third World Quarterly* 40(4):668–687.

Frankel, Jeffrey A., and Andrew K. Rose. 2005. Is trade good or bad for the environment? Sorting out the causality. *Review of Economics and Statistics* 87(1):85–91.

Franzese, Robert J., JR., and Jude C. Hays. 2007. Spatial econometric models of cross-sectional interdependence in political science panel and time-series-cross-section data. *Political Analysis* 15:140–164.

Garmann, Sebastian. 2014. Do government ideology and fragmentation matter for reducing CO_2-emissions? Empirical evidence from OECD countries. *Ecological Economics* 105:1–10.

Garrett, Geoffrey. 1998. Partisan politics in the global economy. Cambridge et al.: Cambridge University Press.

Giddens, Anthony. 2015. The politics of climate change. *Policy & Politics* 43(2):155–162.

Gleditsch, Nils Petter, and Bjørn Sverdrup. 2002. Democracy and the environment. In *Human security and the environment. International comparisons*, eds. Edward A. Page and Michael Redclift, 45–70. Cheltenham & Northhampton (MA): Edward Elgar.

Graham, Erin R., Charles R. Shipan, and Craig Volden. 2012. Review article: The diffusion of policy diffusion research in political science. *British Journal of Political Science* 43:673–701.

Ha, Eunyoung. 2008. Globalization, veto players, and welfare spending. *Comparative Political Studies* 41(6):783–813.

Hance, Jeremy. 2009. Ban Ki-Moon: climate change 'greatest collective challenge we face'. https://news.mongabay.com/2009/08/ban-ki-moon-climate-change-greatest-collective-challenge-we-face/. Accessed 13 Nov 2019.

Hardin, Garrett. 1968. The tragedy of the commons. *Science* 162:1243–1248.

Harrison, Kathryn, and Lisa McIntosh Sundstrom. 2007. The comparative politics of climate change. *Global Environmental Politics* 7(4):1–18.

Harrison, Kathryn, and Lisa McIntosh Sundstrom. 2010. Introduction: Global commons, domestic decisions. In *Global commons, domestic decisions. The comparative politics of climate change*, eds. Kathryn Harrison, and Lisa McIntosh Sundstrom, 1–22. Cambridge & London: The MIT Press.

Haustein, Karsten, Friederike E.L. Otto, Victor Venema, Peter Jacobs, Kevin Cowtan, Zeke Hausfather et al. 2019. A limited role for unforced internal variability in twentieth-Century warming. *Journal of Climate* 32:4893–4917.

Held, David, and Angus Hervey. 2011. Democracy, climate change and global governance: Democratic agency and the policy menu ahead. In *The governance of climate change. science, economics, politics and ethics*, eds. David Held, Angus Hervey, and Marik Theros, 89–110. Cambridge & Malden: Polity Press.

Holzinger, Katharina, Christoph Knill, and Thomas Sommerer. 2008. Environmental policy convergence: The impact of international harmonization, transnational communication, and regulatory competition. *International Organization* 62:553–587.

IPCC (The Intergovernmental Panel on Climate Change). 2015. Climate change 2014: synthesis report. Contribution of working groups I, II and III to the fifth assessment report of the Intergovernmental Panel on Climate Change, eds. Core Writing Team, Rajendra K. Pachauri, and Leo Meyer. Geneva: IPCC.

Jahn, Detlef. 2016. The politics of environmental performance. Institutions and preferences in industrialized democracies. Cambridge: Cambridge University Press.

Jahn, Detlef, and Sebastian Stephan. 2015. The problem of interdependence. In *Comparative politics. Theoretical and methodological challenges*, eds. Dietmar Braun, and Martino Maggetti, 14–54. Cheltenham & Northhamption (MA): Edgar Elgar Publishing.

Jänicke, Martin. 1998. Umweltpolitik: Global am Ende oder am Ende global? Thesen zu ökologischen Determinanten des Weltmarktes. In *Perspektiven der Weltgesellschaft*, ed. Ulrich Beck, 332–344. Frankfurt am Main: Suhrkamp Verlag.

Lederer, Markus. 2014. Die Macht des Südens in der globalen Klimapolitik. In *Die großen Schwellenländer. Ursachen und Folgen ihres Aufstiegs in der Weltwirtschaft*, eds. Andreas Nölke, Christian May, and Simone Claar, 319–336. Wiesbaden: Springer VS.

Lederer, Markus. 2017. Umwelt und internationale Politik. In *Handbuch Internationale Beziehungen*, eds. Frank Sauer, and Carlo Masala, 1095–1119. Wiesbaden: Springer VS.

McBeath, Jerry, and Jonathan Rosenberg. 2006. Comparative environmental politics. Dordrecht: Springer.

NASA (National Aeronautics and Space Administration). 2019. The effects of climate change. https://climate.nasa.gov/effects/. Accessed 11 May 2019.

Oatley, Thomas. 2011. The reductionist gamble: Open economy politics in the global economy. In *International Organization* 65(2):311–341.

Paarlberg, Robert. 1997. Earth in abeyance: Explaining weak leadership in U.S. international environmental policy. In *Eagle adrift. American foreign policy at the end of the century*, ed. Robert J. Lieber, 135–160. New York et al.: Longman.

Perkins, Richard, and Eric Neumayer. 2012. Do recipient country characteristics affect international spillovers of CO_2-efficiency via trade and foreign direct investment? *Climatic Change* 112(2):469–491.

Povitkina, Marina. 2018. The limits of democracy in tackling climate change. In *Environmental Politics* 27(3):411–432.

Purdon, Mark. 2015. Advancing comparative climate change politics: Theory and method. *Global Environmental Politics* 15(3):1–26.

Putnam, Robert D. 1988. Diplomacy and domestic politics: the logic of two-level games. *International Organization* 42(3):427–460.

Rudra, Nita. 2002. Globalization and the decline of the welfare state in less-developed countries. *International Organization* 56(2):411–445.

Rudra, Nita, and Stephan Haggard. 2005. Globalization, democracy, and effective welfare spending in the developing world. *Comparative Political Studies* 38(9):1015–1049.

Ruoff, Gabriele. 2009. Grow rich and clean up later? Joint effects of IGO membership and democracy on environmental performance in developing countries. National Centre of Competence in Research (NCCR) (Challenges to Democracy in the 21st Century Working Paper 33).

Schulze, Kai. 2014. Do parties matter for international environmental cooperation? An analysis of environmental treaty participation by advanced industrialised democracies. *Environmental Politics* 23(1):115–139.

Scruggs, Lyle. 2003. Sustaining abundance: Environmental performance in industrial democracies. Cambridge: Cambridge University Press.

Spilker, Gabriele. 2013. Globalization, political institutions and the environment in developing countries. New York, London: Routledge.

Sussman, Glen. 2004. The USA and global environmental policy: Domestic constraints on effective leadership. *International Political Science Review* 25(4):349–369.

Stadelmann-Steffen, Isabelle. 2011. Citizens as veto players: climate change policy and the constraints of direct democracy. *Environmental Politics* 20(4):485–507.

Tezanos Vázquez, Sergio, and Andy Sumner. 2013. Revisiting the meaning of development: A multidimensional taxonomy of developing countries. *Journal of Development Studies* 49(12):1728–1745.

Tubi, Amit, Itay Fischhendler, and Eran Feitelson. 2012. The effect of vulnerability on climate change mitigation policies. *Global Environmental Change* 22(2),472–482.

Underdal, Arild. 2010. Complexity and challenges of long-term environmental governance. *Global Environmental Change* 20(3):386–393.

Vogler, John. 2008. Environmental issues. In *Globalization of world politics. An introduction to international relations*, eds. John Baylis, Steve Smith, and Patrick Owens, 350–368. 4th edition: Oxford: Oxford University Press.

Waltz, Kenneth N. 1959. Man, the state and war. New York & London: Columbia University Press.

Wenzelburger, Georg, and Frieder Neumann. 2015. Vergleichende Staatstätigkeitsforschung: Entwicklungslinien - Heidelberger Schule - integrative Erklärungsansätze. In *Einführung in die Vergleichende Politikwissenschaft. Institutionen – Akteure – Policies*, eds. Uwe Wagschal, Sebastian Jäckle, and Georg Wenzelburger, 251–264. Stuttgart: Verlag W. Kohlhammer.

Wenzelburger, Georg, and Reimut Zohlnhöfer. 2015. Konzepte und Begriffe in der Vergleichenden Policy-Forschung. In *Handbuch Policy-Forschung*, eds. Georg Wenzelburger, and Reimut Zohlnhöfer, 15–32. Wiesbaden: Springer VS.

Young, Oran R. 1997. Rights, rules, and resources in world affairs. In *Global governance. Drawing insights from the environmental experience*, ed. Oran R. Young, 1–23. Cambridge (MA) & London: The MIT Press.

Zohlnhöfer, Reimut. 2005. Globalisierung der Wirtschaft und nationalstaatliche Anpassungsreaktionen. Theoretische Überlegungen. *Zeitschrift für Internationale Beziehungen* 12(1):41–75.

Zohlnhöfer, Reimut. 2016. Policy-Theorien in der Vergleichenden Politikwissenschaft. In *Handbuch Vergleichende Politikwissenschaft*, eds. Hans-Joachim Lauth, Marianne Kneuer, and Gert Pickel, 221–233. Wiesbaden: Springer VS.

2 Conceptualisation and measurement of climate commitment and performance

Abstract

The joint influence of globalisation and domestic political institutions should be studied separately in relation to different environmental problems. Political decision-makers have fewer incentives to tackle the negative consequences of international integration on climate change than to address local and regional environmental problems. As the solution to global warming depends on international coordination, this study examines variations in state participation in the UN climate change regime. This chapter defines the dependent variable as a commitment to the central goals and principles of the UN climate change regime (climate commitment) and the implementation of measures that contribute to its central goal: climate change mitigation (climate performance). In accordance with previous research, both dimensions of climate cooperation are studied separately, as explanatory factors and their interactions may vary between climate commitment and performance. Climate commitment is measured by ratification of the two treaties that fall within the research period (1992–2006), the UNFCCC and the Kyoto Protocol. As determinants and their interactions may vary in accordance with treaty design, the ratification of each climate agreement is investigated separately. To conceptualise the second dimension, this chapter explains how the climate performance concept is used, based on climate policy outcomes (CO_2 emissions), in comparison to other concepts. Finally, as the UN climate change regime defines different obligations for developed and developing countries, this study distinguishes between developed and developing countries in its analysis of the potential moderation effects of domestic political institutions.

This study analyses the joint effect of globalisation and domestic political institutions on cross-national variations in climate commitment and performance. To this end, the first section (2.1) of this chapter explains the focus on state participation in the UN climate change regime and specifies the dependent variable as a commitment to its common goals (climate commitment) and implementing policy measures that contribute to climate change mitigation (climate performance). Moreover, it argues that, for theoretical and empirical reasons, the factors that explain climate commitment and performance should be studied separately. In academic research, different conceptualisations and measures have been applied to both dimensions of climate cooperation. Sections 2.2 and 2.3 specify these and explain the measurements. The moderation effects of domestic political institutions on the influence of globalisation on climate commitment and performance may vary between developed and developing countries. For this reason, the empirical analysis considers differences between developed and developing countries. The final section summarises the conclusions.

2.1 State participation in international climate cooperation

Broad and narrow definitions of environmental policy can be distinguished in environmental policy research. Broad definitions refer to political decisions on the relationship between a society and its environment (Saretzki, 2005, p. 1049; Tuschhoff, 2015, p. 209). Narrow understandings specify environmental policy as a set of political decisions to protect and ameliorate natural resources (Tosun, 2015, p. 641; Tosun, 2012, p. 437). In accordance with the literature on the environmental consequences of globalisation, this study adopts a narrow definition. Environmental policy is a multidimensional concept, differentiated in relation to specific environmental problems that need to be tackled (Tosun, 2015, p. 642). Climate policy refers to state efforts to protect our global atmosphere. This study limits the dependent variable to a country's participation in climate cooperation. The following section explains this specification in relation to the research question.

For theoretical and empirical reasons, it is important to study specific environmental problems separately when exploring the potential moderation effects of domestic political institutions on the influence of globalisation. The existing literature suggests that state responses to environmental challenges and the relative importance of political explanatory factors depend on the type of environmental problem (e.g., Spilker, 2013). In this respect, the combination of several characteristics distinguishes the climate crisis from other environmental problems. First, climate change is a global environmental problem. It has worldwide causes and consequences. Moreover, the effects of global warming are unequally spread across the world. Political authorities have fewer incentives to adopt and implement climate-protection policies than measures to solve local and regional environmental problems. The issue visibility of domestic environmental problems is higher (see also Cao & Prakash, 2012, p. 67). If they aim to stay in power, political authorities are presumably more interested in solving domestic environmental problems

than in ensuring global environmental change. They may even shift the responsibility for climate protection to the international level. In addition, various social groups support global and domestic environmental protection (Farzin & Bond, 2006, p. 232). Most environmental non-government organisations (ENGOs) focus on local and regional environmental problems. Second, the diffuse consequences of climate change are felt only in the long term. As with global pollution, citizens and political decision-makers are presumably more concerned about environmental problems with immediate consequences (Lederer, 2017, p. 1104; Neumayer, 2002a, p. 159). The link between human behaviour and environmental problems is also more obvious in this case.[11] Finally, solving the climate change problem depends on making fundamental changes to our daily lives and economic system. It is associated with considerable short-term economic costs for societies and individuals. Reducing greenhouse gas emissions will change energy production, production processes, transport systems, and consumption patterns. It is therefore easier for politicians and interest groups to mobilise domestic and international support for environmental policies that are not associated with considerable short-term costs. In sum, domestic political factors that help to explain domestic and global pollution should be studied separately. Previous empirical research supports this conclusion. Spilker (2013, p. 102) has found that states are less likely to ratify international agreements that deal with global environmental problems than to address local environmental problems.

This study argues that the joint effects of globalisation and domestic political institutions should be studied separately for different environmental problems. Climate change is a global collective action problem (see Chapter 1). As major economic activities are associated with greenhouse gas emissions, political decision-makers have, for competitive reasons, an incentive to free-ride on the climate change mitigation efforts of other countries. This implies that they are less motivated to tackle global air pollution through international integration. Thus, governments are likely to react in different ways to domestic and global pollutants caused by international economic integration. Setting aside differences in political institutions and policy preferences, governments are likely to respond in similar ways to climate-related externalities of globalisation. Domestic political factors may be of little importance in shaping the impact of economic globalisation on climate protection. For this reason, Cao and Prakash (2012, p. 72, footnote) have focused on analysing the joint effect of veto players and international economic integration on domestic pollution. Empirical studies have shown that the interaction effects of globalisation and domestic political institutions vary across environmental problems. While Spilker (2013) has found that trade openness has a less negative effect on local air pollution (SO_2 emissions) in democratic countries, the relationship between trade openness and global air pollution (CO_2 emissions) does not differ between democracies and autocracies. Cao and Prakash (2012) have observed that veto players reduce the effect of trade competition more on local air pollution (SO_2 emissions) than on water pollution. They argue that issue visibility varies between the two types of pollution and that different social groups support air and water protection. This pattern also applies to local and global environmental problems. Their findings suggests that domestic political factors are unlikely to significantly influence the impact of international integration on global pollutants. As the following chapter will show, the globalisation/environment literature partly assumes that domestic politics do not contribute to the influence of globalisation on climate commitment and performance (e.g. race-to-the-bottom theory). Nonetheless, it is important to study possible interaction effects between domestic political and international factors that can help to explain climate commitment and performance. First, it is an empirical question whether domestic politics influence the effect of globalisation on climate protection. Second, while governments may react in similar ways to competition pressures caused by international economic integration, country differences in domestic political institutions may moderate incentives derived from political globalisation and (as context conditions of international trade and investment) affect the relationship between economic openness and climate performance (see Chapter 5). Finally, there may be differences between types of domestic political institutions (see Chapter 5).

Climate policy is a multilevel policy. State actors and non-state actors on the local, domestic, international, and supranational level are involved in policies that affect the global atmosphere (Brühl, 2007, p. 710). To analyse causal pathways, it is necessary to restrict the analysis to specific aspects of climate policy. This study therefore focuses on state participation in climate cooperation within the UNFCCC framework. This is the only climate change regime that is open to worldwide participation. Most countries are member states. Most political-science studies (e.g., Milner, 1997, p. 7; Milner, 1992, p. 467) define international cooperation in accordance with Keohane (2005 [1984]). This conceptualisation is equally relevant to the analysis of state participation in climate cooperation. Keohane (2005 [1984]) asks how international cooperation is possible under conditions of anarchy and interdependence, context conditions that characterise the climate change problem. There is no world government to take responsibility for climate protection, a problem that can only be solved through international efforts. According to Keohane (2005 [1984], pp. 51f., emphasis in original)

> '*intergovernmental cooperation takes place when the policies actually followed by one government are regarded by its partners as facilitating realization of their own objectives, as the result of a process of policy coordination*'.

[11] This enables political decision-makers to question human-caused global warming.

Two implications follow from this definition. First, international cooperation implies goal-directed behaviour among countries (Milner, 1997, p. 7; Milner, 1992, p. 468). International cooperation takes place when states deliberately coordinate and adjust their policies to solve a mutual policy problem or to realise mutual gains (Milner, 1992, p. 468). It is therefore necessary for states to agree on common goals (Bättig et al., 2008, p. 479).[12] Second, international cooperation only takes place when countries implement measures to realise their common goals, in anticipation of other states doing the same (Bättig et al., 2008, p. 479; Milner, 1997, pp. 7f.; Milner, 1992, p. 468). In this way, they contribute to mutual gains or help to reduce the negative consequences of their policies on other states (policy coordination) (Milner, 1997, pp. 7f.; Milner, 1992, p. 468). Based on this definition, the degree of state participation in climate cooperation refers to a country's commitment to the common goals of the climate change regime and the policy adjustments it makes to realise them. The following subsections specify the two dimensions of state participation in international climate policy and explain how they are measured.

Keohane (2005 [1987]) regards both dimensions as necessary conditions of international cooperation. Following previous research (e.g., Bättig & Bernauer, 2009), this study measures and examines them separately, given that explanatory factors vary between climate commitment and performance. It is easier for states to ratify climate treaties than to adopt national policies to mitigate global warming (Kneuer, 2012, p. 873). Additionally, the ratification of international agreements is more transparent; it is therefore easier for citizens and interest groups to pressure the government to enter into a climate treaty than to make it adopt and implement climate change mitigation policies. Chapter 5 will argue that the interaction effects between domestic political institutions and globalisation vary between climate commitment and performance as well. Given state participation in multilateral climate cooperation, this study focuses on national climate policies, i.e. political measures adopted at the national level. Only national governments are able to ratify international agreements; they are the most important actors in the adoption and implementation of domestic climate policies to reduce greenhouse gas emissions (see Chapter 1; Scruggs, 2003, p. 22).

In sum, this study focuses, for both theoretical and empirical reasons, on state participation in climate cooperation. The relative importance of explanatory factors of climate commitment and performance, as well as interaction effects between them, may vary among environmental and climate policies. This study defines the dependent variable as state commitment to the common goals of the UN climate change regime and the implementation of policy measures that contribute to these goals. The present study examines both dimensions – climate commitment and performance – separately, as explanatory factors may vary between the two dimensions.

2.2 Climate commitment

The following section discusses climate commitment (2.2.1). The second section uses this discussion and that of previous measurement approaches to explain how climate commitment is measured by UNFCCC and the Kyoto Protocol ratification delay in the following empirical analysis (2.2.2).

2.2.1 Conceptualisation of climate commitment

During the research period (1992–2006) (see Chapter 6), two important international climate agreements within the UNFCCC came into force. The UNFCCC itself was adopted at the UN Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 and became active in 1994 (Gupta, 2010, p. 639). The Kyoto Protocol did not introduce any new goals or principles (Gupta, 2010, p. 643). The central aim of the UNFCCC is the 'stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.' (UN, 1992, Art. 2). By adopting this goal, the two climate treaties have focused on climate change mitigation, i.e. the reduction of the velocity and consequences of global warming (Kyiar, 2013, no page number).[13]

Climate commitment has been defined as state commitment to the common goals. It is important to consider the main principles of climate cooperation as well. Countries that have not ratified climate treaties within the UNFCCC framework (and those that have withdrawn their ratification) have questioned these principles. Article 3 of the UNFCCC defines its principles as follows: (1) Countries have the right and are expected to pursue sustainable development (UN, 1992, Article 3). Economic development is regarded as important condition for climate change mitigation. Measures to reduce greenhouse gas emissions should, therefore, consider a country's economic development. (2) The precautionary principle expects countries 'to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects' (UN, 1992, Art. 3). (3) The UNFCCC maintains that the situation of

[12] State interests in participating in international cooperation can still vary among actors (Milner, 1997, p. 77; Milner, 1992, p. 468).

[13] The UNFCCC regarded climate change adaptation, i.e. the 'adjustment to actual or expected *climate* and its effects' (IPCC, 2015, p. 118; emphasis in original) as a local problem (Gupta, 2010, p. 642). Over time a shift to climate change adaptation has been observed (McLuhan, 2011, p. 401).

developing countries must be taken into account (e.g., their vulnerability to global warming). (4) The cost-effectiveness of climate change mitigation policies should be considered. Countries are expected to cooperate and help each other (esp. developing countries) to achieve sustainable development (5). The most important and controversial principle of the UNFCCC is the principle of common but differentiated responsibilities (6). Developed countries are expected to take the lead in reducing greenhouse gas emissions. They are regarded as historically responsible for global warming. Moreover, developed economies have the financial and technological capability to tackle global warming. There are disagreements between and within the two groups of countries, regarding the principle of common but differentiated responsibilities (Brühl, 2012, p. 726). The controversy has led to negotiation blocs among rich countries. On the one hand, member states of the European Union (EU) supported the principle of common but differentiated principles (Brühl, 2012, p. 726; Christoff & Eckersley, 2011, p. 439). On the other hand, the so-called Umbrella group (Australia, Canada, Iceland, Japan, New Zealand, Norway, Russia, the Ukraine, and the USA) refused to accept legally binding greenhouse gas emissions reduction targets (Brühl, 2012, p. 726; Christoff & Eckersley, 2011, p. 439). Brühl (2012, p. 726) identifies groups of developing countries by their positions on international climate policy: (1) Countries with low greenhouse gas emissions but a perceived vulnerability to the impacts of climate change; (2) states with high global air-pollution levels that accept climate-policy measures only under the condition of financial and technical support (e.g. China, Brazil, India); and (3) oil-exporting economies that were not willing to accept measures that could affect their revenues. These differences within both groups of countries affect their ratification behaviour (Christoff & Eckersley, 2011, p. 439). The present study therefore argues that climate commitment implies agreement with the goals and main principles of the UN climate change regime. Countries may agree with the goal of greenhouse gas emissions stabilisation but disagree with the negotiated principles proposed to realise these goals. For instance, the US did not accept the argument that developed countries should take the lead in climate change mitigation and did not ratify the Kyoto Protocol.
The UNFCCC defines developed countries as Organisation for Economic Co-operation and Development (OECD) member states in 1992 and economies in transition in Eastern Europe and the Russian Federation (UNFCCC, no year). These countries are called Annex I parties and they are obliged to reduce greenhouse gas emissions to 1990 levels until 2000 (Kyiar, 2013). They are further divided into Annex II and economies in transition. Within the Kyoto Protocol, the former are obliged to reduce greenhouse gas emissions to 1990 levels, provide financial resources to developing countries and to promote the transfer of environmentally friendly technologies (Gupta, 2010, pp. 638ff.; UNFCCC, no year). Economies in transition are allowed more flexibility to reach their greenhouse gas emissions targets (Gupta, 2011, pp. 639f.; UN, 1992, Art. 4). Non-Annex I, i.e. developing countries have the right to focus on their socio-economic development. The UNFCCC only requires them to support the spread of environmentally friendly technologies and practices (Fredriksson & Gaston, 2000, p. 346).
It is important to study domestic political explanatory factors of climate commitment and their interplay separately, in relation to developed and developing countries. First, participation within the UNFCCC framework implies different obligations for developed and developing countries (also Fredriksson et al., 2007, p. 232). Second, positive incentives in climate treaties, such as climate change mitigation support, make developing countries more likely to ratify them (Iwińska et al., 2019, p. 2; Susskind, 1994, p. 44). Second, because of their reliance on the agricultural sector, poor countries are more vulnerable to the consequences of climate change (e.g., extreme weather) (Lederer, 2014, p. 324, footnote; McLuhan, 2011, p. 405). Third, political authorities in the developing world have fewer resources to mitigate global warming and adapt to climate change (McLuhan, 2011, p. 405). In sum, we can assume that rich and poor countries differ systemically in their motivations for joining international climate cooperation.
Climate commitment is defined as the degree of acceptance of the central goal of UNFCCC (climate change mitigation) and its central principles. This section has shown that differences can be expected in the domestic political factors that account for climate commitment among developed and developing countries.

2.2.2 Measurement of climate commitment

This section describes the measurement of climate commitment by UNFCCC and the Kyoto Protocol ratification delay. It begins by comparing the reliability and validity of approaches to measuring climate commitment in the measurement and aggregation phase of index construction. Based on this discussion, the chapter outlines the measurement of the dependent variable. Environmental commitment has been measured using data on the existence, type, width and/or depth of environmental regulations, as well as their monitoring and enforcement (Tosun, 2015, p. 646; Tosun, 2012, p. 442). The data are based on observable state behaviour, statistical data and/or expert evaluations.[14] The measures either focus on specific indicators or summarise multiple indicators.

[14] The stringency of environmental law can also be measured by data on the perception of the stringency of environmental law by citizens or business representatives (Tosun, 2012, p. 441). However, it does not measure actual state behaviour (Tosun, 2012, p. 441).

Measurement approaches based on expert evaluations

Climate policy is a cross-cutting policy that can encompass many different policy measures from multiple policy fields (Harrison & Sundstrom, 2010, p. 7; Steves & Teytelboyn 2013, p. 3). Expert evaluations can capture this complexity. The climate-policy component of the Germanwatch Climate Change Performance Index (CCPI) gives equal weight to a country's domestic and international climate policy, drawing on evaluations provided by national climate change experts (Burck et al., 2016, p. 14). The international climate-policy component evaluates a country's intended climate change mitigation efforts and what has been done in this regard (Burck et al., 2016, p. 14). The measure thus combines climate commitment and performance. The same applies to the Climate Laws, Institutions, and Measures Index (CLIMI) from Steves and Teytelboyn (2013), which measures the stringency of climate change mitigation policies. Moreover, CCPI (2010–2017) and CLIMI (a cross-sectional measure, based on the period 2005–2010) are only available for more recent years. Important independent variables for this study are not available for these years. In addition, CCPI data are not comparable over time (Burck et al., 2016, p. 15), as indicator measurement rules and the number and composition of coders have changed over time. Finally, the CLIMI is based on annual national communications to the UNFCCC. Their comparability is questionable.

Measurement approaches based on statistical data

The Kyoto Protocol defines, for developed countries, legally binding emissions targets within the commitment period. The more ambitious the negotiated reduction of a country's greenhouse gas emissions, the higher its climate commitment. They vary considerably among countries. Greenhouse gas emissions targets under the Kyoto Protocol are a reliable and available indicator of climate commitment. It is important to use the relative reduction to the business-as-usual development of greenhouse gas emissions (Compston & Bailey, 2016, p. 145; Harrison & Sundstrom, 2007, p. 4). For instance, it was easy for Russia to accept its target, as a stabilisation of its greenhouse gas emissions was expected after the end of the Soviet Union (Harrison & Sundstorm, 2007, p. 4). In contrast to EU member states, Australia and the US would have had to reduce a considerable part of their greenhouse gas emissions to fulfil their commitments (Harrison & Sundstorm, 2007, p. 4). Greenhouse gas emissions targets can help to understand climate commitment of developed countries. As Non-Annex I countries are not obliged to mitigate climate change, greenhouse gas emissions targets cannot be used as a dependent variable in a worldwide analysis.

Climate commitment can also be measured via a country's climate-expenditure data. The more a country invests in climate protection, the more important it considers this policy goal to be (List & Sturm, 2006, p. 1261; Tosun, 2015, p. 646). Higher expenditure levels enable national environment agencies to implement environmental protection policies via skilled staff, providing more opportunities to control the environmental behaviour of citizens and firms (Tosun, 2015, p. 646; Tosun, 2012, p. 442). State-expenditure data provide a reliable indicator of climate commitment, which can also be attributed to political authorities (Tosun, 2015, pp. 645f.). However, they cannot capture the stringency of environmental regulations (content validity) (Tosun, 2015, p. 646). Moreover, comparable data on state expenditure on climate change mitigation are not available for worldwide analyses. Climate change mitigation and adaptation support, provided by developed countries, can be used as an indicator of each country's acceptance of the principle of helping developing countries. In accordance with the UNFCCC, Annex II parties are expected to provide financial assistance to developing countries to mitigate and help them adapt to global environmental change (Corfee-Morlot et al., 2009, p. 11; UN, 1992, Article 4). These data cannot be applied in a worldwide analysis of climate commitment.

Measures based on observable state behaviour

Given data availability, most studies rely on codings of observable state behaviour. In addition to the ratification/non-ratification of climate agreements, researchers have coded the reporting behaviour of states and financial contributions to the international climate regime (e.g., Bättig et al., 2008; Bernauer & Böhmelt, 2013a). The monitoring of state behaviour is an important instrument of international cooperation. The UNFCCC requires countries regularly to submit reports on their efforts to implement international climate commitments. The reporting behaviour of countries is easily observable on the UNFCCC homepage. The data are reliable and comparable. Non-Annex I parties do not have to report as regularly as developed countries. This questions its use as time-series cross-sectional indicator (e.g., Bernauer & Böhmelt, 2013a). In addition, it only applies to countries that are parties of the climate change regime. Its validity is also limited. Reporting is often delegated to civil servants. Bernauer and Böhmelt (2013a) consider whether a country has regularly paid its annual financial contributions to the UNFCCC Secretariat in a timely fashion as an indicator of climate commitment. These contributions are important to the functioning of the UNFCCC Secretariat (Bättig et al., 2008, p. 481). They also tell us something about a country's climate commitment. For instance, President Trump threatened to cut US financial contributions to the UNFCCC Secretariat. This measure is reliable and comparable, but it does not apply to non-members of the climate change regime. With regard to validity, it is a low-cost option for most countries.

Most quantitative studies of climate commitment have examined the ratification of specific climate treaties (especially the UNFCCC and/or the Kyoto Protocol). The assumption is that a country that ratifies an international

treaty accepts its goals and principles. Few scholars have examined the signing of climate treaties[15]. Only ratified international agreements are domestically binding (Barrett, 2003, pp. 147; Schulze, 2014, p. 116). Two measurement approaches can be distinguished (Neumayer, 2002b, pp. 818f.): (1) measurement by a dichotomous variable (ratification vs. non-ratification) (e.g., Fredriksson & Ujhelyi, 2006; Neumayer, 2002b; Zahran et al., 2007) which is examined using logit/probit analysis; and (2) measurement by a continuous variable that captures a country's ratification duration (e.g., Fredriksson & Gaston, 2000; Fredriksson et al., 2007; Neumayer, 2002b; von Stein, 2008; Zahran et al., 2007), examined via a survival analysis. Given the lack of variation, the first approach is not applicable to international agreements with nearly universal membership (i.e. worldwide membership) (e.g., UNFCCC and the Kyoto Protocol) (Neumayer, 2002b, p. 818). The second measurement approach refers to ratification duration or delay, i.e. the time period between the official launch of the ratification process and the day of ratification (Fredriksson & Gaston, 2000, p. 347; Neumayer, 2002b, p. 818). Fast ratification is considered an indicator of climate commitment (e.g., Fredriksson & Gaston, 2000, p. 347; Fredriksson et al., 2007, p. 235; von Stein, 2008, p. 262). Climate treaties enter into force when a minimum number of countries become parties to the agreements. For this reason, ratification delay affects the implementation and effectiveness of international agreements (Fredriksson & Gaston, 2000, p. 347f.; Fredriksson & Ujhelyi, 2006, p. 1; Sand, 1991, p. 240). Second, ratification signals support of the treaty to other countries (Bättig et al., 2008, p. 480), thus hastening the entry into force of an agreement (Fredriksson & Gaston, 2000, p. 348). Ratification delay prolongs the ratification phase for all (von Stein, 2008, p. 262) and affects the behaviour of non-parties as well as parties to the agreement (Fredriksson & Gaston 2000, p. 348). Countries are expected to delay ratification to avoid that other countries free-ride on their participation (Fredriksson & Gaston 2000, p. 348).

Ratification or ratification delay is a reliable indicator of commitment (Böhmelt et al., 2015, p. 103). Information on the ratification status and time point of ratification is available online for all countries and comparable across countries[16] and over time. The validity of ratification duration of international climate agreements as an indicator of climate commitment has been questioned. (1) First, many environment agreements imply none or only weak efforts for environmental protection (Böhmelt et al., 2015, p. 103; Neumayer, 2002b, pp. 818f.). This means that all countries can afford to ratify them (Neumayer, 2002b, pp. 818f.). The ratification of climate treaties may, therefore, not necessarily mean that countries are committed to their goals and principles. The UNFCCC implies little binding commitments for developed and developing countries. It does not formulate binding greenhouse gas emissions targets. The same applies to the Kyoto Protocol, in the case of developing countries. From this perspective, only the ratification of the Kyoto Protocol can tell us anything about the climate commitment of Annex I countries. For instance, Australia has withdrawn from its ratification of the Kyoto Protocol and the US has never ratified it. (2) A related argument is that international environmental agreements often lack compliance mechanisms to ensure their implementation. Accordingly, the ratification of environmental agreements may not reflect a real commitment to their goals, as countries can join 'without being able or willing to fully implement the commitments set forth therein' (Böhmelt et al., 2015, p. 103). Nonetheless, there are reasons to use the ratification of international climate agreements as an indicator of climate commitment within the UNFCCC. (1) As described above, climate agreements often imply only weak efforts to tackle global environmental change. It must be taken into account that international climate agreements are the result of a consensus during an international negotiation process. The unanimity rule implies that countries agree to the environmental regulations accepted by the least environmentally friendly country that signs the agreement (Fredriksson & Gaston, 2000, p. 347; Sand, 1991, p. 240). Ratification of an international climate agreement, therefore, implies a country's 'willingness to accept an international consensus' (Meadowcroft, 2014, p. 43). For instance, the US announced that it would leave the Paris Agreement, even though it stipulates only on voluntary state contribution to climate protection. Second, ratification reflects a government's climate commitment because it implies that the government accepts climate-protection goals that are more ambitious than those in previous international agreements (Böhmelt et al., 2015, p. 103). Leinaweaver (2012, p. 15, footnote) maintains that a country's ratification of environmental treaties may be regarded by domestic non-state actors as a stronger signal of its willingness to reduce pollution than domestic policy pledges. Von Stein (2008, p. 262) notes that '[t]he nonratifiers will be those whose behaviour deviates most notably from what the treaty prescribes or proscribes.' (3) Finally, as explained above, the ratification of an international climate agreement within the UNFCCC framework is of central importance for the effectiveness of climate cooperation. Thus, Fredriksson et al. (2007, p. 231) note that '[t]he ratifications stage of an international environmental agreement [...] is a crucial part of cooperation on global pollution problems.' Regarding validity, it must be noted that ratification delay can be caused by other variables (Neumayer, 2002b, pp. 818f.). For instance, a large number of domestic veto players may delay the domestic ratification process. This is considered in the multivariate models in Chapters 7 and 8.

[15] For instance, Neumayer (2002b).

[16] As I will explain below, the Annex I status of parties to the treaties must be controlled, since their obligations vary.

In sum, this study regards ratification delay as a valid and reliable indicator of state acceptance of the goals and principles of international climate agreements. It is interpreted as the acceptance of the international consensus on climate protection. The ratification of the UNFCCC and Kyoto Protocol by an Annex I country is not comparable to the ratification of these climate treaties by a Non-Annex I member state. To account for this, Annex I membership is included in this analysis and developing Non-Annex I countries are also explored separately. Developed Annex I countries cannot be studied separately because there is little variation. The EU negotiates in climate agreements for its member states (Kyiar, 2013, no page number). EU member states agreed to share burdens under the Kyoto Protocol and enter it together. Their ratification behaviour cannot, therefore, be seen as independent state behaviour (von Stein, 2008, p. 256). Therefore, in this analysis of the Kyoto Protocol, EU-member states are treated as a single state.

The importance of treaty design

Previous quantitative research on the factors that explain climate commitment can be further distinguished by whether it analyses a single indicator or uses a summary measure (e.g., Bättig et al., 2008; Bättig & Bernauer, 2009; Bernauer & Böhmelt, 2013a,b). While composite measurements are better able to handle complexity and reduce measurement error, single indicators make it possible to test causal processes more effectively (Jahn & Wälti, 2007, p. 266). Most quantitative studies of environmental commitment use, as their indicator, the number of international environmental agreements a country has ratified (additive index). The underlying assumption is that the more international agreements a country ratifies, the more committed it is to environmental cooperation. In comparative climate policy research, two summary measures are based on observable state-behaviour data: Bättig et al.'s (2008) Climate Cooperation Index and Bernauer and Böhmelt's (2013a) Climate Change Cooperation Index (C3-I). The former summarises cross-sectional indicators of commitment and performance. The C3-I is based on the Climate Cooperation Index. It provides panel data, separate measures of commitment and performance, and a summary measure. Climate commitment is measured using UNFCCC and Kyoto protocol ratification, financial contributions to the UNFCCC Secretariat, and national communications.

It is important to study the moderation effects of domestic political institutions on the influence of globalisation separately for UNFCCC and Kyoto Protocol ratification. The International Relations literature has shown that treaty design affects ratification behaviour (e.g., Bernauer et al., 2013; Spilker, 2013; von Stein, 2008). Abbott and Snidal (2000) distinguish international agreements on a continuum from soft to hard international law, based on three criteria: obligation, precision, and delegation (see also Yamagata et al., 2013). 'Hard' law refers to 'binding obligations that are precise (or can be made precise through adjudication or the issuance of detailed regulations) and that delegate authority for interpreting and implementing the law' (Abbott & Snidal, 2000, p. 421). Soft law refers to international agreements that are weaker, with regard to the extent and precision of obligations and/or the delegation of authority (Abbott & Snidal, 2000, p. 422). Spilker (2013, pp. 93f., 97) evaluates the hardness or softness of international environmental treaties by examining the specification and existence of precise obligations for treaty parties, and mechanisms to monitor state behaviour and enforce state commitments. Most scholars classify the UNFCCC as a soft agreement for all countries and the Kyoto Protocol as a hard or harder international agreement for Annex I countries (e.g., Karlsson-Vikhuyzen & Vihma, 2009, p. 404; Spilker, 2013, p. 97f.; von Stein, 2008, p. 246; Yamagata et al., 2013, p. 255). The UNFCCC requires its member states to develop national plans to control their emissions (von Stein, 2008, p. 246). Annex I states are expected to reduce their greenhouse gas emissions to 1990 levels. These obligations are not legally binding (von Stein, 2008, p. 246f.). The climate-change-mitigation goal is interpreted as a 'declaration of intent for climate protection' (Bättig et al., 2008, p. 480; see also McLuhan, 2011, p. 247; von Stein, 2008, p. 247). The UNFCCC goal is imprecise, as it does not define specific greenhouse gas emissions reduction targets for member countries (Karlsson-Vikhuyzen & Vihma, 2009, p. 404; von Stein, 2008, p. 247). Following von Stein (2008, p. 248), the UNFCCC is moderately characterised by the delegation of authority to third parties. The Conference of Parties consists of representatives of the member states; it makes decisions unambiguously and monitors national communications and emission inventories. While it encompasses a dispute-settlement mechanism, it does not define either specific state obligations or monitoring and enforcement procedures (Spilker, 2013, p. 97). The Kyoto Protocol includes legally binding greenhouse gas emissions reduction targets for Annex I countries. These targets are precisely formulated and quantified; Annex I countries were expected to reach them between 2008 and 2012 (Karlsson-Vikhuyzen & Vihma, 2009, p. 404; von Stein, 2008, p. 247). The Kyoto Protocol also delegates, through its compliance mechanism, more authority to the Conference of Parties (Karlsson-Vikhuyzen & Vihma, 2009, p. 404; von Stein, 2008, p. 247f.). The Conference of Parties monitors the implementation and compliance of climate change mitigation by Annex I countries and oversees the flexibility provisions of the Kyoto Protocol (Spilker, 2013, p. 98; von Stein, 2008, p. 248). Hovi et al. (2007, p. 437) have argued that the compliance mechanism is weak. Although the Kyoto Protocol has no enforcement mechanisms, the monitoring of states can have a reputational cost for those states (von Stein, 2008, p. 248). Moreover, the treaty takes over the UNFCCC dispute-settlement mechanism (Spilker, 2013, p. 98). The Kyoto Protocol can be described as a soft agreement vis-à-vis Non-Annex I countries, as it does not involve binding obligations (Bernauer et al., 2013, p. 485; Yamagata et al., 2013, p. 255). Nonetheless, the Kyoto Protocol has

been contested by developing countries. Active participation in the treaty, beyond its ratification, can also have domestic implications. For instance, the clean development mechanisms that support sustainable development and environmental protection imply that developing countries must become active in these areas.

Most scholars have concluded that states are more likely to join soft agreements than hard ones (Downs et al., 1996; Spilker, 2013; von Stein, 2008). States avoid hard treaties because they have participation costs, stipulate precise obligations that involve domestic-policy changes, and imply a shift in authority, monitoring and enforcing state behaviour in a way that can limit sovereignty (Spilker, 2013, p. 94). Although states often regard hard treaties as more effective, they are associated with higher reputational costs (Spilker, 2013, p. 94). As the Kyoto Protocol is only hard for Annex I countries, differences in ratification behaviour between Annex I and Non-Annex I parties to the agreement can be assumed (von Stein, 2008, p. 248). Annex I countries may be less likely to ratify the Kyoto Protocol than Non-Annex I countries because the treaty includes binding greenhouse gas emissions reduction targets for the former only. According to Spilker (2013, p. 102), treaties that include incentives (e.g., technical and financial assistance) increase participation (Spilker, 2013, p. 102). This may also contribute to the ratification of the Kyoto Protocol by Non-Annex I countries. In sum, to consider differences in treaty design that affect ratification behaviour, UNFCCC and Kyoto Protocol ratification must be examined separately for developed and developing countries.

Treaty design is also relevant to any analysis of the explanatory factors of climate commitment. Previous studies have shown that the relative importance of international and domestic explanatory factors varies between UNFCCC ratification and Kyoto Protocol ratification (von Stein 2008; Yamagata et al., 2013). Von Stein (2008) and Yamagata et al. (2013) assume that domestic variables matter more for the ratification of hard than soft treaties, while international explanatory factors are more important for the ratification of soft international treaties. Thus, positive incentives derived from international political integration should apply more to UNFCCC than to the Kyoto Protocol ratification ($H_{treatydesign}1$). The competition pressures of economic globalisation do not affect soft international agreements, which have few costs for participating countries. The effect of the ratification behaviour of economic competitors is unclear in the case of hard international law, as represented by the Kyoto Protocol (Yamagata et al., 2013, p. 256). States are reluctant to let other countries free-ride on their efforts (Yamagata et al., 2013, p. 256). However, as explained above, there are disagreements about the principle of common but differentiated responsibilities among Annex I and Non-Annex I countries. Given the range of different negotiated greenhouse gas emissions targets, it was easier for some Annex I countries to ratify the Kyoto Protocol than for others. In sum, there should be no clear effect of international economic integration on UNFCCC and Kyoto Protocol ratification ($H_{treatydesign}2$).

Yamagata et al. (2013) have argued that domestic explanatory factors are crucial when international agreements restricts domestic sovereignty (e.g., economic costs). They find support for their hypothesis that domestic explanatory factors explain Kyoto Protocol ratification better than they explain UNFCCC ratification ($H_{treatydesign}3$, see Table 2.1). Domestic determinants also matter more for the ratification behaviour of countries that profit from joining international agreements (e.g., developing countries profit from the spread of technology and financial contributes) (Yamagata et al., 2013, p. 254). This finding applies to developing countries that profit from participation in the Kyoto Protocol. To date, no studies have investigated whether the interaction effects between domestic and international factors that explain international cooperation vary in accordance with treaty design. However, it is plausible to assume that they do influence moderation effects, when there is an impact on domestic and international determinants. Chapter 5 considers treaty design in relation to the possible moderation effects of domestic political institutions and globalisation.

Table 2.1 Hypotheses on treaty design and climate commitment

$H_{treatydesign}1$	International political integration contributes more to explaining UNFCCC than Kyoto Protocol ratification.
$H_{treatydesign}2$	There is no clear effect of international economic integration on UNFCCC or Kyoto Protocol ratification.
$H_{treatydesign}3$	Domestic political factors matter more for Kyoto Protocol than UNFCCC ratification.

In sum, this study defines climate commitment as ‘acceptance of the common goals and principles of international climate change cooperation’. It uses the delay in ratifying the UNFCCC and Kyoto Protocol as an indicator of climate commitment. There are more recent international climate agreements. The latest is the 2016 Paris Agreement. However, the UNFCCC and Kyoto Protocol were introduced during the period 1992–2006, for which this study has data for all independent and dependent variables. These data also make the present study comparable to earlier research. Annex I status makes it possible to take the differing climate-protection obligations of developed and developing countries into account. To consider differences in treaty design, UNFCCC and Kyoto Protocol ratification are examined separately. Differences in the relative importance of domestic and international explanatory factors for UNFCCC and Kyoto Protocol ratification can be assumed. The next chapters (Chapters 3–5) will,

therefore, formulate separate hypotheses on the effect of international integration and domestic political institutions, as well as their joint effect on UNFCCC and Kyoto Protocol ratification.

2.3 Climate performance

Section 2.1 defined the second dimension of state participation in international climate policy as implementing measures to realise common goals. 'Implementation refers to measures that countries take to effectuate international treaties in their domestic law' (Brown Weiss & Jacobsen, 1999, p. 19). This book analyses the goal of the UN climate change regime: to stabilise greenhouse gas emissions in the global atmosphere. First, climate change mitigation is the central goal of UNFCCC and the Kyoto Protocol (see Chapter 2.2). Second, we can assume that explanatory factors and their relative importance vary among the international climate-cooperation goals (e.g., determinants of climate change mitigation vs. determinants of sustainable development).[17] Third, this limitation is in line with similar research (e.g., Bättig et al., 2008; Bättig & Bernauer, 2009; Bernauer & Böhmelt, 2013a). The following empirical analysis explains the selected conceptualisation (2.3.1) and the way it is measured using CO_2 emissions (2.3.2).

2.3.1 Conceptualisation of climate performance

Similar studies have conceptualised the dependent variable as compliance with international agreements, environmental quality, or environmental performance. Compliance 'refers to whether countries in fact adhere to the agreement's provisions and to the implementing measures that they have instituted.' (Brown Weiss & Jacobsen, 1999, p. 18). In comparative climate policy research, this definition is used to analyse the compliance of Annex II parties with the greenhouse gas emissions targets defined in the Kyoto Protocol or the burden-sharing agreement, in the case of EU members (e.g., Jensen & Spoon, 2011). The compliance concept cannot be applied in a worldwide study because the climate change regime does not define any binding emissions targets for non-Annex II parties (see also Bättig et al. 2008, p. 295).

Numerous studies of globalisation and the global environment have used, as their dependent variable, either environmental quality or environmental degradation. The terms 'environmental quality', 'environmental degradation', and 'environmental performance' are used inconsistently in the literature. The first two concepts refer to the state of the environment (Jahn, 2013, p. 150). Climate quality, therefore, describes the 'condition of the climate system' (Meadowcroft, 2014, p. 43), i.e. the levels of greenhouse gases in the atmosphere or changes in global and regional temperatures and weather conditions (Meadowcroft, 2014, p. 43). While it is important to study climate quality (see for instance Saretzki, 2007, pp. 421f.), this concept is problematic when analysing the political explanatory factors of environmental pollution (Jahn, 2013, p. 150; Jahn & Wälti, 2007, p. 266). First, the condition of the international climate system is considerably dependent on natural variables (Roller, 2005, pp. 44f.). Second, political decisions influence our atmosphere only in the long term (Meadowcroft, 2014, p. 43). Finally, changes in the climate system cannot easily be attributed to individual countries (Meadowcroft, 2014, p. 43).

This study applies the concept of 'environmental performance'. Performance can be divided into procedural and substantive performance (Roller, 2005, p. 21; Weaver & Rockman, 1993, pp. 5f.). The former is defined as 'the capability, stability, and efficiency of the government' (Hanusch, 2018, p. 31). Substantive performance refers to specific policy fields (e.g., environmental performance). As this study aims to explain cross-national variation in climate performance, the dependent variable refers to climate performance at the state level. There are two environmental-performance approaches (Fiorino, 2011, p. 369f.; Meadowcroft, 2014, p. 29; Saretzki, 2007, p. 427). The first approach evaluates a country's environmental policy outputs. The more active a country is in protecting the climate, or the more stringent its climate policy, the better its performance (Duit, 2005, p. 13; Meadowcroft, 2014, p. 43). The second approach refers to the results of climate policies on the environment (climate policy outcomes). Lower levels of greenhouse gas emissions imply a better climate performance. Both approaches have advantages and disadvantages. According to Jahn (2014, p. 83), Roller (2005, pp. 32f.) and Scruggs (2003, pp. 20ff.) environmental performance should be measured by outcome indicators. Jahn (2014, p. 83) maintains that '[w]hile the introduction of an environmental policy or the establishment of an environmental institution or organization may have the intention of reducing pollution, the empirical proof of its effectiveness can be measured only by the outcomes' (see also Scruggs, 2003, p. 6). Christoff and Eckersley (2011, p. 432) argue that the '[t]he ultimate measure of national performance, and the one most relevant to the UNFCCC's basic objective of minimizing the risk of dangerous climate change, is the level of, and changes in, a country's emissions' (see also Bättig et al., 2008, p. 481). Consequently, greenhouse gas emissions are of public interest (Scruggs, 2003, p. 21) and the 'most significant measure in the success of climate policies' (Burck et al., 2016, p. 7). Finally, the

[17] Nonetheless, future research should study other goals of the climate change regime, such as climate change adaptation (see also Javeline, 2014).

globalisation/environment literature also assumes direct effects of international trade and investment on greenhouse gas emissions (see Chapter 3).

In contrast to the environmental policy outcome, environmental policy output is directly attributable to political decision-makers (Saretzki, 2007, p. 424). There are numerous intervening variables between political variables and environmental policy outcomes (Tosun, 2012, p. 441). Moreover, greenhouse gas emissions levels and changes are also influenced by economic, demographic, social, natural, economic, and international variables (Christoff & Eckersley, 2011, p. 432; Compston & Bailey, 2016, p. 2; Pellegrini & Gerlagh, 2006, p. 334; Tosun, 2012, p. 441). Hence, the implicit assumption of a linear relationship between environmental policy output and outcome is an empirical question (Saretzki, 2007, p. 424). The conceptualisation of climate performance on the basis of policy outputs is not without problems. First, the literature lacks a common conceptualisation of environmental policy performance (Sewerin, 2013, p. 4). Climate-policy instruments also vary considerably among and within countries (Garmann, 2014, p. 3). Second, specific conceptualisations are problematic. For instance, the assumption that adopting more climate policies implies better performance is questionable (Meadowcroft, 2014, p. 43; Scruggs, 2003, pp. 22f.). 'Taxes on energy are not always raised to influence behavior and reduce emissions, but sometimes simply to generate revenues' (Garmann, 2014, p. 3). Meadowcroft (2014, p. 43) observes that while Australia, Canada, and the US provide significant financial resources for researching and developing climate-mitigation technologies, they avoid actual regulations to reduce greenhouse gas emissions. Third, climate policy outputs can only measure the intention of climate policies (rules of law) (Cao & Prakash, 2012, p. 72; Jahn, 2014, p. 83; Scruggs, 2003, pp. 22f.). They tell us nothing about their impact on the atmosphere. Climate change mitigation also depends on the implementation (Welsch, 2004, p. 665) and effectiveness of climate policies. Governments may undermine environmental regulations without changing the law (Cao & Prakash, 2012, p. 70). The US Environmental Protection Agency often cannot enforce existing environmental regulations because it is underfunded (Cao & Prakash, 2012, pp. 70f.). Finally, as climate policy is a cross-cutting policy (Brühl, 2007, p. 710), other policies are also associated with greenhouse gas emissions (Harrison & Sundstrom, 2010, p. 7; Steves & Teytelboyn 2013, pp. 4f.).

The best approach would be to study climate performance on the basis of output and outcome data. Unfortunately, there is insufficient comparable and available cross-sectional or panel data on the adoption and stringency of climate outputs, especially outside the developed world. This study, therefore, examines climate policy outcomes. To address the problem of whether they are influenced by non-political factors, it considers relevant controls on CO_2 emissions (see also Jahn, 2014, p. 84). Not all research on climate policy outcomes refers to the performance concept. Some studies define the dependent variable as environmental quality or environmental degradation and study greenhouse gas emissions or specific greenhouse gas emissions. The application of the concept of environmental performance, however, links the present study to previous research and offers a theoretical framework for the conceptualisation and measurement of the dependent variable.

Environmental performance, in relation to environmental outcomes, is defined as the degree of societal attainment of environmental goals by political actions (Meadowcroft, 2014, p. 28; Roller, 2005, p. 21). This makes it possible to conceptualise the level of measures implemented to realise the common goal of international climate cooperation. Narrow and broad environmental performance concepts can be distinguished (Meadowcroft, 2014, p. 28; Tosun, 2012, p. 441). Broad concepts refer to the degree of attainment of multiple environmental policy goals (Meadowcroft, 2014, p. 29; Scruggs, 2003, p. 21). Accordingly, this research applies composite indices of environmental outcomes (e.g., Scruggs, 2003). As Section 2.1 argues, it is necessary to examine the determinants of climate-protection efforts separately from other environmental problems. A narrow conception, limited to a specific pollutant, is therefore appropriate. As the following section will explain, this study focuses on CO_2 emissions. To apply environmental performance concepts, political decision-makers must be aware of the particular environmental problem in question – and regard it as solvable (Jahn, 2014, p. 83; Jahn & Wälti, 2007, p. 266). Climate change has only been regarded as a political problem since the 1990s (Jahn, 2014, p. 83). Therefore, this study only studies climate performance since the beginning of the UN climate change regime (see Chapter 6). The concept of environmental performance makes it possible to evaluate a country's environmental outcomes (Jahn & Wälti, 2007; Meadowcroft, 2014, p. 29). To conceptualise climate performance, it is necessary to have a standard for assessing a country's performance (Meadowcroft, 2014, p. 28). Many studies do not consider this and simply examine greenhouse gas emissions or specific global air pollutants. Empirical criteria (e.g., a comparison with other countries and time points) or theoretical criteria (e.g., greenhouse gas emissions reduction targets) to compare a country's climate performance can be defined (Burnell, 2012, p. 824; Jahn & Wälti, 2007, p. 265; Roller, 2005, pp. 20, 71). Binding emissions targets only exist for Annex I countries under the Kyoto Protocol. For this reason, a country's climate performance is compared to other countries and other time points as standard. Previous research has examined variations in climate performance among countries worldwide. To a lesser extent, country differences among developed (e.g., Tobin, 2017) and developing countries (e.g., Spilker, 2013) have been studied. The climate change regime distinguishes between the obligations of Annex I and non-Annex I parties. It is therefore important to evaluate and examine the climate performance of developed and developing countries separately.

In addition, developed countries have higher greenhouse gas emissions because their industrialisation processes started earlier. They also have more political capability to reduce global air pollution.
In sum, this study conceptualises the second dependent variable as a country's relative climate performance, based on CO_2 emissions, in comparison to other developed/developing countries and years during the research period. Developed and developing countries are studied separately.

2.3.2 Measurement of climate performance

The varied findings of previous studies (see Chapters 3 & 4) may reflect variations in measurement decisions (see also Fiorino, 2011, p. 371). This section discusses the validity and reliability of climate-performance measurement approaches, while explaining the operationalisation of the dependent variable in the following empirical analysis. Qualitative research consists of case studies and QCA (e.g., Never & Betz, 2014; Sewerin, 2013; Tobin, 2017). Quantitative research mainly uses data on climate policy outcomes. Based on this conceptualisation of climate performance, the present study focuses on approaches that use climate policy outcome data.
The policy outcome indicators of climate performance are divided into direct and indirect (Gleditsch & Sverdrup, 2002, pp. 58f.) or primary and secondary indicators (Christoff & Eckersely, 2011, p. 433). Most studies apply direct or primary indicators, i.e. greenhouse gas emissions or decarbonisation data (Christoff & Eckersley, 2011, pp. 433f.; Gleditsch & Sverdrup, 2002, pp. 58f.). Secondary or indirect indicators refer to drivers of greenhouse gas emissions, such as Gross Domestic Products (GDP) and GDP growth, types and sources of energy supplies, population growth, population density, consumption patterns, and urban population (Christoff & Eckersley, 2011, p. 434; Gleditsch & Sverdrup, 2002, p. 58; Meadowcroft, 2014, p. 44). As the socio-economic structure of a society is influenced by political-decision makers over many decades, it can only be used as an indicator of climate performance if it is examined over a long period of time (Meadowcroft, 2014, p. 44). In the short term, the structure of a society acts as a context factor, affecting political behaviour (Meadowcroft, 2014, p. 44). The following empirical study controls important context factors (see Chapter 6).
Primary and direct indicators can be broken down into impact and environmental quality indicators (Scruggs, 2003, pp. 24f.). Environmental quality indicators aim to capture the state of the environment, i.e. CO_2 concentrations in the global/local atmosphere. The use of environmental quality indicators to measure environmental performance is based on the argument that 'pollutants are dangerous only when concentrated' (Scruggs, 2003, p. 24; see also Bernauer & Koubi, 2013, p. 598). The concentration of greenhouse gases in the atmosphere can have natural sources (e.g., volcanic activity) and is therefore not a suitable indicator of environmental performance (Jahn, 2014, pp. 83f.)[18]. Second, concentrations of pollutants make it difficult to evaluate a country's environmental performance (Scruggs, 2003, p. 26). Hence, most studies that judge climate performance by climate policy outcomes examine greenhouse gas emissions (mainly CO_2 emissions). This aligns with environmental performance research, which prefers impact indicators, i.e. flow indicators, over environmental quality indicators, i.e. stock indicators (Jahn, 2014, p. 83; Meadowcroft, 2014, p. 28f.; Roller, 2005, p. 45). Environmental performance should only be measured using indicators that can be shaped by political decision-makers (Jahn & Wälti, 2007, p. 266). To assess whether global warming will result from the concentration of greenhouse gases in the atmosphere, cumulative emissions can be used. The present study examines current emissions, as climate change has only been recognised as a political problem since the 1990s (Meadowcroft, 2014, pp. 41f.). Moreover, cumulative emissions can only be changed by political authorities over long periods of time (Jahn, 2014, p. 84).
There is no agreement in the environmental performance literature on the use of emissions levels (e.g., Bättig & Bernauer, 2009) and/or changes (mainly annual changes) (e.g., Bättig & Bernauer, 2009; Garmann, 2014). The conceptualisation of climate performance as changes in greenhouse gas emissions is appropriate since the goal of international climate policy is to reduce and stabilise greenhouse gas emissions (see also Scruggs, 2003, pp. 20ff.). Second, levels can only be changed in the long run (Burck et al., 2014, p. 5; Jahn, 2014, p. 84). Finally, the democracy/environment literature argues that democracies cannot be expected to have less pollution than autocracies while undertaking more efforts to reduce pollution (Bättig & Bernauer, 2009, p. 292; Neumayer 2002a, p. 144). Nonetheless, pollution levels should be studied as well. First, countries with stable low emission levels do not perform less well than countries with high reductions and high emission levels (e.g., Christoff & Eckersley, 2011, p. 432). Second, emissions can change for various reasons that unrelated to changes in climate policy (Meadowcroft, 2014, p. 42). Meadowcroft (2014, p. 42) argues that changes in emissions do not necessarily capture 'performance'. Third, short-term changes in environmental outcomes are often caused by economic, social, or environmental variables (Scruggs, 2003, p. 19). Political factors influence environmental outcomes only in the long term (Scruggs, 2003, p. 19). To conclude, both levels and changes in greenhouse gas emissions should be studied. Long-term changes are preferable to short-term changes in emissions. In accordance with most studies, I limit my analysis to the study of emissions levels, as indicators of climate performance. First, data on emissions-

[18] Jahn (2014, pp. 83f.) argues that natural disasters can result from environmental policies. However, he opts to not consider them, as they do not relate to regular environmental performance (Jahn, 2014, pp. 83ff.).

level changes are more uncertain. For instance, short-term trends in CO_2 emissions vary in accordance with data sources (Macknick, 2011, p. 194). Second, I do not use a summary measure of emissions levels and changes (e.g., Jahn & Wälti, 2007), as previous research has shown that political factors, such as democracy quality, affect CO_2 emission levels and changes in different ways (e.g., Bättig & Bernauer, 2009; Escher & Walter-Rogg, 2018).

The climate change mitigation goal of UN climate cooperation refers to the most important greenhouse gases. In accordance with most previous studies, the present study focuses on CO_2 emissions. First, the emissions data related to other greenhouse gases have higher levels of uncertainty (World Resources Institute, 2015); data availability is also limited. Second, CO_2 emissions are considered the main source of global warming (IPCC, 2015, p. 5). It is important to note that the statistical results refer only to CO_2 emissions. For instance, Kneuer (2012, pp. 878f.) observes that 'China is investing heavily in renewable sources of energy while at the same time being a major methane producer as a result of its high demand for rice.'

Two types of data relate to greenhouse gas emissions: estimates based on the relationship between an economic activity and emissions, and direct measurements (Rypdal & Winiwarter, 2001, p. 108). Both are characterised by uncertainty, as the real extent of emissions is unknown (Rypdal & Winiwarter, 2001, p. 108). The present study uses estimated emissions data. Data on actual emissions is not available for large-N analysis. CO_2 emissions estimates are available from various sources: CO_2 emissions from fossil-fuel combustion, cement production, municipal waste, land use, forestry and wood burning, natural gas flaring, and biomass combustion (Macknick, 2011, p. 197). This study examines CO_2 emissions data from energy production and use, fossil-fuel combustion, and cement manufacturing as these are the most important sources of CO_2 emissions (IPCC, 2015, p. 5; Spilker, 2013; p. 25; World Bank, 2016a, p. 92). CO_2 emissions from fossil-fuel combustion and cement production 'include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring.' (World Bank, 2016b, no page number). Data on other CO_2 sources has limited availability and comparability; it is partly associated with high uncertainty levels (Burck et al., 2016, p. 10; Strazicich & List, 2003, p. 264).

The present study uses data from the World Bank Development Indicators (World Bank, 2016b). It offers CO_2 emissions estimates from fossil-fuel burning and cement manufacturing by the U.S. Department of Energy's Carbon Dioxide Information Analysis Center (CDIAC), the U.S. Bureau of Mine's Cement Manufacturing Data Set (World Bank, 2016a, p. 92) as well as standardised data from other sources (World Bank, 2016a, pp. 83, 92). CDIAC uses fossil-fuel data from the United Nations Statistics Division's World Energy Data Set (World Bank, 2016a, p. 92). According to the World Resources Institute (2015, p. 6), the World Bank has the highest data availability, in relation to numbers of countries and years. Yet, Macknick (2011, p. 194) has argued that global CO_2 emissions from CDIAC fuel-combustion estimates are, on average, higher than estimates from the International Energy Agency (IEA) and the Emissions Database for Global Atmospheric Research (EDGAR). Other data sources include CO_2 emissions data from the UNFCCC, based on the national communications of treaty parties. While these statistics have good accuracy (World Resources Institute, 2015, p. 7), availability is limited for Non-Annex I countries. Climate Data Explorer (CAIT) data from the World Resources Institute incorporate data from the IEA, CDIAC, and US Energy Information Administration (EIA). The use of different data sources makes it especially problematic compare data over time (World Resources Institute, 2015, pp. 8f.). Galeotti et al. (2006) have found that the source of CO_2 emissions data has no effect on their EKC result.

CO_2 emissions refer here to emissions within the country. Thus, the data do not consider 'embodied energy' (Bättig et al., 2008, p. 487), i.e. CO_2 emissions from the production of imported goods. The concept is useful because it captures emissions that can be influenced by national governments (Burck et al., 2016, p. 8). However, CO_2 emissions data do not consider that countries with low CO_2 emission levels may have externalised pollution-intensive production to other countries (Meadowcroft, 2014, p. 42) (see also Burck et al., 2016, p. 8). For instance, emissions from China reflect its export production. The same is true of CO_2 emissions from coal extracted in Australia but exported to China (Meadowcroft, 2014, p. 42). An alternative approach would be to measure CO_2 emissions from consumption, not production (Burck et al., 2016 p. 8). However, 'attributing emissions to the state which hosts their production remains the preeminent means of accounting in the international climate regime. Any changes to this notion of responsibility for trade-related emissions would profoundly (re)shape assessments of national responses to climate change.' (Christoff & Eckersley, 2011, p. 432).

Greenhouse gas emissions data, as indicators of climate performance, must be comparable across countries and over time (Jahn, 2014, p. 84; Jahn & Wälti, 2007). States differ in the size of their populations and economies, their natural resources, industry structure, and national capacity (e.g., GDP, fossil-fuel dependency, population growth) (Christoff & Eckersley, 2011; Meadowcroft, 2014, p. 41, Neumayer, 2003, p. 208). To consider this, previous studies have used per-capita emissions, per unit of GDP emissions, or a combination of both. Following earlier research, the present study has controlled for population size, which varies considerably among countries. China has the highest CO_2 emission levels. When population size is considered, the US has the highest CO_2 emissions per capita rate. To compare climate performance, population size must therefore be controlled; CO_2 emissions from different countries are adjusted by the total population size of each country (total CO_2 emissions/total population size = CO_2 emissions per capita) (see also Neumayer, 2003, p. 208; Spilker, 2013, p. 25). Second, from

an equity perspective, per-capita emissions are the relevant indicator. Meadowcroft (2014, p. 41) has argued that 'there is no a priori justification for one group of humans to be allowed to do more of an activity that harms the common weal than another.' Neumayer (2003, p. 208) has argued that '[f]rom a human health perspective, per-capita pollution is arguably a more relevant indicator than pollution per unit of GDP.' However, CO_2 emissions per unit of GDP correct pollution data by the size of the economy, measuring the efficiency of the country's economy with regard to CO_2 emissions (Bernauer & Böhmelt, 2013a, p. 198; Meadowcroft, 2014, p. 41). Cao and Prakash (2010, p. 485) have argued that this is the relevant indicator for analysing the effect of trade competition because it measures the costs of environmental regulations in unit of GDP. In accordance with Bernauer and Böhmelt (2013a, p. 199), this study uses the ratio of emissions and per-capita GDP. In sum, climate performance is measured by CO_2 emissions per capita as indicator weighted by the ratio of per-capita GDP (see also Bernauer & Böhmelt, 2013a, p. 199).

As the previous section explains, empirical criteria are used to consider the evaluative component of the performance concept and to measure relative climate performance across countries and over time. The empirical criteria applied include the best and worst performance values across countries over the entire research period (see Roller, 2005, p. 71). Given the need for comparable cases (Jahn, 2014, p. 83), I have applied separate criteria for best/worst performance among developed and developing countries. The scale ranges from 0 (worst relative performance) to 100 (best relative performance).

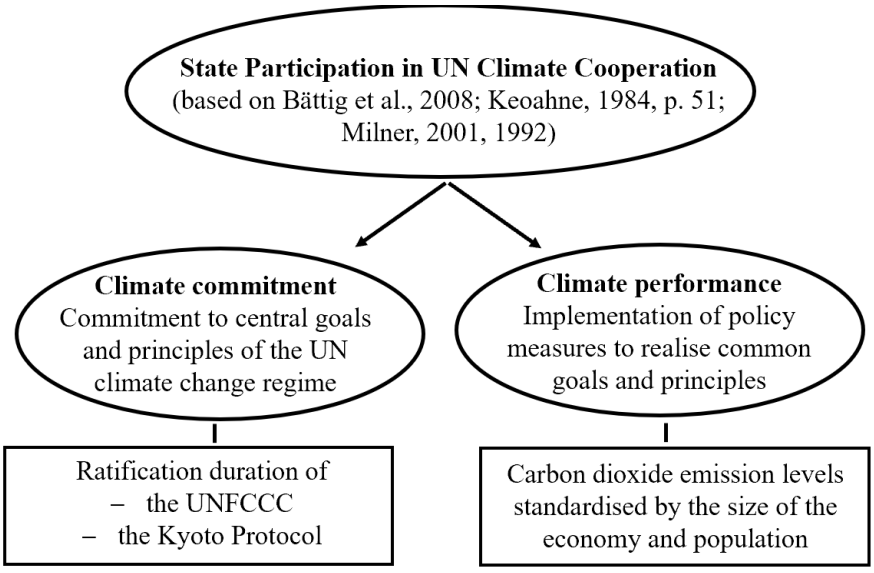
Most studies of climate performance apply panel regression (time-series cross-sectional analysis, TSCS). The underlying assumption (that explanatory factors have a constant effect on climate performance over time and across countries) is questionable. For instance, political explanatory factors, including domestic political institutions, influence climate outcomes via climate policy outputs in the long term only (Pellegrini & Gerlagh, 2006, p. 336). Moreover, while some scholars explicitly focus on within variation (see Chapters 3 & 4), many studies that do not estimate between-variation are mainly interested in country differences (e.g., Spilker, 2013). To a lesser extent, between-variation (cross-sectional OLS regression of averages values over the research period) and/or within-variation models are tested. Studies that examine separately variation across countries and over time find different results related to the effect of explanatory factors (e.g., Escher & Walter-Rogg, 2018). It is therefore important to study variance over time and across countries separately. This study focuses on between variation, as institutional aspects of democracy vary little over time and presumably take some time to influence climate performance (Fredriksson & Neumayer, 2013, p. 12). Here, country averages were examined over the research period (see Chapter 6) as a dependent variable.

In sum, this study measures climate performance over the research period, using country averages for CO_2 emissions, standardised by country size and the size of the economy and standardised by the best/worst-practice approach across developed/developing countries and over time.

2.4 Conclusions

This study limits the analysis to state participation in the UN climate change regime as explanatory factors may vary among environmental policies. Figure 2.1 summarises the conceptualisation and measurement of the dependent variable.

Figure 2.1 State participation in UN climate cooperation



Political decision-makers have fewer incentives to tackle climate change than to address local and regional environmental problems. Thus, domestic political institutions tend to make little difference in the effect of globalisation on state participation in international climate cooperation. It is an empirical question whether domestic political institutions matter to the relationship between globalisation and state participation in international efforts to tackle climate change. As Chapter 5 will argue, interaction effects may vary between dimensions of globalisation and with specific domestic political and institutional factors. The dependent variable is commitment to the central goals and principles of the UN climate change regime (climate commitment) and implementing measures that contribute to its central goal (climate change mitigation) (climate performance). For theoretical and empirical reasons, the determinants of both dimensions of climate cooperation are studied separately. This study argues that this approach is also relevant to interaction effects between globalisation and domestic political institutions. Climate commitment is measured by the delay in ratifying two treaties that fall within the research period: UNFCCC and the Kyoto Protocol. As explanatory factors may vary in accordance with treaty design, the two climate agreements are studied separately. Treaty design must therefore be considered when analysing the joint effect of international integration and domestic political institutions. To conceptualise the second dimension, this chapter explains how the climate performance concept is used, based on climate policy outcomes, as opposed to other relevant concepts. Finally, I distinguish between the two country groups, as international climate regimes define different obligations for developed and developing countries.

References

Abbott, Kenneth W., and Duncan Snidal. 2000. Hard and soft law in international governance. *International Organization* 54(3):421–456.

Bättig, Michèle B., and Thomas Bernauer. 2009. National institutions and global public goods: Are democracies more cooperative in climate change policy? *International Organization* 63(2):281–308.

Bättig, Michèle B., Simone Brander, and Dieter M. Imboden. 2008. Measuring countries' cooperation within the international climate change regime. *Environment Science & Policy* 11:478–489.

Barrett, Scott. 2003. Environment and statecraft. The strategy of environmental treaty-making. Oxford: Oxford University Press.

Bernauer, Thomas, and Tobias Böhmelt. 2013a. National climate policies in international comparison: The climate change cooperation index. *Environmental Science & Policy* 25:196–206.

Bernauer, Thomas, and Tobias Böhmelt. 2013b. Are economically "kinder, gentler societies" also greener? *Environmental Science & Technology* 47(21):11993–12001.

Bernauer, Thomas, and Vally Koubi. 2013. Are bigger governments better providers of publig goods? Evidence from air pollution. *Public Choice* 156:593–609.

Bernauer, Thomas, Anna Kalbhenn, Vally Koubi, and Gabriele Spilker. 2013. Is there a “depth versus participation” dilemma in international cooperation? *The Review of International Organizations* 8(4):477–497.

Böhmelt, Tobias, Thomas Bernauer, and Vally Koubi. 2015. The marginal impact of ENGOs in different types of democratic systems. *European Political Science Review* 7(1): 93–118.

Brown Weiss, Edith, and Harold K. Jacobson. 1999. Getting countries to comply with internationl agreements. *Environment: Science and Policy for Sustainable Development* 41(6):16–20.

Brühl, Tanja. 2007. Umweltpolitik. In *Handbuch zur deutschen Außenpolitik*, eds. Siegmar Schmidt, Gunther Hellmann, and Reinhard Wolf, 703–712. Wiesbaden: VS Verlag für Sozialwissenschaften.

Brühl, Tanja. 2012. Internationale Umweltpolitik. In *Einführung in die Internationale Politik*. Studienbuch. 5., vollständig überarbeitete Auflage, ed. Michael Staak, 710–736. Munich: Oldenbourg Verlag.

Burck, Jan; Hermwille, Lukas, and Christoph Bals. 2014. The climate change performance index. Background and methodology. Germanwatch & Climate Action Network Europe. Bonn & Berlin.

Burck, Jan, Lukas Hemwille, and Christoph Bals. 2016. Climate change performance index. Backkground and methodology. Berlin & Brussels: Germanwatch & Climate Action Network Europe.

Burnell, Peter. 2012. Democracy, democratization and climate change: complex relationships. *Democratization* 19(5):813–842.

Cao, Xun, and Aseem Prakash. 2010. Trade competition and domestic pollution: A panel study, 1980-2003. *International Organization* 64: 481–503.

Cao, Xun, and Aseem Prakash. 2012. Trade competition and environmental regulations: Domestic political constraints and issue visibility. *The Journal of Politics* 74(1):66–82.

Christoff, Peter, and Robyn Eckersley. 2011. Comparing state responses. In *Oxford handbook of climate change and society*, eds. John S. Dryzek, Richard B. Norgaar, and David Schlosberg, 431–448. Oxford et al.: Oxford University Press.

Compston, Hugh, and Ian Bailey. 2016. Climate policy strength compared: China, the US, the EU, India, Russia, and Japan. *Climate Policy* 16(2):145–164.

Corfee-Morlot, Jan, Bruno Guay, and Kate Karsen. 2009. Financing climate change mitigation. Towards a framework for measurement, reporting and verification. OECD Publishing (OECD/ IEA Climate Change Expert Group Papers 2009/06).

Downs, George W., David M. Rocke, and Peter N. Barsoom. 1996. Is the good news about compliance good news about cooperation? *International Organization* 50(3):379–406.

Duit, Andreas. 2005. Understanding environmental performance of states: An institution-centered approach and some difficulties. Gothenburg: The QOG Institute. Quality of Government. University of Gothenburg. (QOG Working Paper Series 7).

Escher, Romy, and Melanie Walter-Rogg. 2018. Does the conceptualization and measurement of democracy quality matter in comparative climate policy research? *Politics and Governance* 6(1):117–144.

Farzin, Y. Hossein, and Craig A. Bond. 2006. Democracy and environmental quality. *Journal of Development Economics* 81(1):213–235.

Fiorino, Daniel J. 2011. Explaining national environmental performance: approaches, evidence, and implications. *Policy Sciences* 44(4):367–389.

Fredriksson, Per G., and Noel Gaston. 2000. Ratification of the 1992 climate change convention: What determines legislative delay? *Public Choice* 104:345–368.

Fredriksson, Per G., and Eric Neumayer. 2013. Democracy and climate change policies: Is history important? *Ecological Economics* 95:1–19.

Fredriksson, Per G., Eric Neumayer, and Gergely Ujhelyi. 2007. Kyoto Protocol cooperation: Does government corruption facilitate environmental lobbying? *Public Choice* 133(1-2):231–251.

Fredriksson, Per G., and Gergely Ujhelyi. 2006. Political institutions, interest groups, and the ratification of international environmental agreements. https://www.researchgate.net/profile/Per_Fredriksson. Accessed 13 Nov 2019.

Galeotti, Marzio, Allesandro Lanza, and Francesco Pauli. 2006. Reassessing the environmental Kuznets curve for CO_2 emissions: A robustness exercise. *Ecological Economics* 57(1):152–163.

Garmann, Sebastian. 2014. Do government ideology and fragmentation matter for reducing CO_2-emissions? Empirical evidence from OECD countries. *Ecological Economics* 105:1–10.

Gleditsch, Nils Petter, and Bjørn Sverdrup. 2002. Democracy and the environment. In *Human Security and the Environment. International Comparisons*, eds. Edward A. Page, and Michael Redclift, 45–70. Cheltenham & Northhampton (MA): Edward Elgar.

Gupta, Joyeeta. 2010. A history of international climate change policy. *Wiley Interdisciplinary Reviews: Climate Change* 1(5):636–653.

Hanusch, Frederic. 2018. Democracy and climate change. London & New York: Routledge.

Harrison, Kathryn, and Lisa McIntosh Sundstrom 2007. The comparative politics of climate change. In *Global Environmental Politics* 7(4):1–18.

Harrison, Kathryn, and Lisa McIntosh Sundstrom. 2010. Introduction: Global commons, domestic decisions. In *Global commons, domestic decisions. The comparative politics of climate change*, eds. Kathryn Harrison nd Lisa McIntosh Sundstrom, 1-22. Cambridge & London: The MIT Press.

Hovi, Jon, Camilla Bretteville Froyn, and Guri Bang. 2007. Enforcing the Kyoto Protocol: can punitive consequences restore compliance? *Review of International Studies* 33:435–449.

IPCC (The Intergovernmental Panel on Climate Change). 2015. Climate change 2014: synthesis report. Contribution of working groups I, II and III to the fifth assessment report of the Intergovernmental Panel on Climate Change, eds. Core Writing Team, Rajendra K. Pachauri, and Leo Meyer. Geneva: IPCC.

Iwińska, Katarzyna, Athanasios Kampas, and Kerry Longhurst. 2019. Interactions between democracy and environmental quality: Toward a more nuanced understanding. *Sustainability* 11(6):1–17.

Jahn, Detlef. 2013. Einführung in die vergleichende Politikwissenschaft. 2. Auflage. Wiesbaden: Springer VS.

Jahn, Detlef. 2014. The three worlds of environmental politics. In *State and environment. The comparative study of environmental governance*, ed. Andreas Duit, 81–109: Cambridge (MA) & London: MIT Press.

Jahn, Detlef, and Sonja Wälti. 2007. Umweltpolitik und Föderalismus. In *Politik und Umwelt*. (Politische Vierteljahresschrift Sonderheft 39/2007), eds. Jacob Klaus, Frank Biermann, Per-Olof Busch, and Peter H. Feindt, 262–279. Wiesbaden: VS Verlag für Sozialwissenschaften.

Javeline, Debra. 2014. The most important topic political scientists are not studying: Adapting to climate change. *Perspectives on Politics* 12(2):420–434.

Jensen, Christian B., and Jae-Jae Spoon. 2011. Testing the 'party matters' thesis: Explaining progress towards Kyoto Protocol targets. *Political Studies* 59(1):99–115.

Karlsson-Vinkhuyzen, Sylvia I., and Antto Vihma. 2009. Comparing the legitimacy and effectiveness of global hard and soft law: An analytical framework. *Regulation & Governance* 3(4):400–420.

Keohane, Robert O. 2005 [1984]. After hegemony. cooperation and discord in the world political economy. Princeton & Oxford: Princeton University Press.

Kneuer, Marianne. 2012. Who is greener? Climate action and political regimes: trade-offs for national and international actors. *Democratization* 19(5):865–888.

Kyiar, Dagmar. 2013. Internationale Klimapolitik: der UNFCCC-Prozess. Bundeszentrale für Politische Bildung. http://www.bpb.de/gesellschaft/umwelt/klimawandel/38529/unfccc-prozess. Accessed 13 Nov 2019.

Lederer, Markus. 2014. Die Macht des Südens in der globalen Klimapolitik. In *Die großen Schwellenländer. Ursachen und Folgen ihres Aufstiegs in der Weltwirtschaft*, eds. Andreas Nölke, Christian May, and Simone Claar, 319–336. Wiesbaden: Springer VS.

Lederer, Markus. 2017. Umwelt und internationale Politik. In *Handbuch Internationale Beziehungen*, eds. Frank Sauer, and Carlo Masala, 1095–1119. Wiesbaden: Springer VS.

Leinaweaver, Justin. 2012. Autocratic ratification: Environmental cooperation to prolong survival (Unpublished manuscript). http://dx.doi.org/10.2139/ssrn.2084866. Accessed 13 Nov 2019.

List, John A., and Daniel M. Sturm. 2006. How elections matter: Theory and evidence from environmental policy. *The Quarterly Journal of Economics* 121(4):1249–1281.

Macknick, Jordan. 2011. Energy and CO_2 emission data uncertainties. *Carbon Management* 2(2):189–205.

McLuhan, Marshall. 2011. Global environmental issues. In *Global Politics*, ed. Andrew Heywood, 383–411. Houndmills et al.: Palgrave Macmillan.

Meadowcroft, James. 2014. Comparing environmental performance. In *State and environment. The comparative study of environmental governance*, ed. Andreas Duit, 27–51. Cambridge (MA) & London: MIT Press.

Milner, Helen V. 1992. International theories of cooperation among nations: Strengths and weaknesses among nations by Josep Grieco; Saving the Mediterranean by Peter Haas. *World Politics* 44(3):466–496.

Milner, Helen V. 1997. Domestic politics and international relations. Princeton, New Jersey: Princeton University Press.

Neumayer, Eric. 2002a. Do democracies exhibit stronger international environmental commitment? A cross-country analysis. *Journal of Peace Research* 39(2):139–164.

Neumayer, Eric. 2002b. Does trade openness promote multilateral environmental cooperation? *The World Economy* 25(6):815–832.

Neumayer, Eric. 2003. Are left-wing party strength and corporatism good for the environment? Evidence from panel analysis of air pollution in OECD countries. *Ecological Economics* 45(2), 203–220.

Never, Babette, and Joachim Betz. 2014. Comparing the climate policy performance of emerging economies. *World Development* 59:1–15.

Pellegrini, Lorenzo, and Reyer Gerlagh. 2006. Corruption, democracy, and environmental policy. *The Journal of Environment & Development* 15(3):332–354.

Roller, Edeltraud. 2005. The performance of democracies. Political institutions and public policies. Oxford: Oxford University Press.

Rypdal, Kristin, and Wilfried Winiwarter. 2001. Uncertainties in greenhouse gas emission inventories - evaluation, comparability and implications. *Environmental Science & Policy* 4:107–116.

Sand, Peter. 1991. International cooperation. In *Preserving the global environment. The challenge of shared leadership*, ed. Jessica Tuchman Matthews, 236–279. New York & London: W.W. Norton & Company.

Saretzki, Thomas. 2005. Umwelt (Umweltpolitik). In *Lexikon der Politikwissenschaft. Theorien, Methoden, Begriffe. Band 2 N-Z*, eds. Dieter Nohlen, and Rainer-Olaf Schulze, 1048–1050. Munich: Verlag C.H. Beck.

Saretzki, Thomas. 2007. Demokatie und Umweltpolitik: Konzeptionelle und methodologische Probleme der makroquantitativ ausgerichteten vergleichenden Umwelt- und Demokratieforschung. In *Politik und Umwelt* (Politische Vierteljahresschrift Sonderheft, 39), eds. Klaus Jacob, Frank Biermann, Per-Olof Busch, and Peter H. Feindt, 409–429. Wiesbaden: Verlag für Sozialwissenschaften.

Schulze, Kai. 2014. Do parties matter for international environmental cooperation? An analysis of environmental treaty participation by advanced industrialised democracies. *Environmental Politics* 23(1):115–139.

Scruggs, Lyle. 2003. Sustaining abundance: Environmental performance in industrial democracies. Cambridge: Cambridge University Press.

Sewerin, Sebastian. 2013. *Comparative climate politics: Patterns of climate policy performance in western democracies*. Inauguraldissertation zur Erlangung des Doktorgrades der Wirtschafts- und Sozialwissenschaftlichen Fakultät der Universität zu Köln. Köln: Universität Köln.

Spilker, Gabriele. 2013. Globalization, political institutions and the environment in developing countries. New York, London: Routledge.

Steves, Franklin, and Alexander Teytelboym. 2013. *Political economy of climate change policy.* Smith School of Enterprise and the Environment. University of Oxford (Smith School Working Paper Series 13-06).

Strazicich, Mark C., and John A. List. 2003. Are CO_2 emission levels converging among industrial countries? *Environmental and Resource Economics* 24:263–271.

Susskind, Lawrence E. 1994. Environmental diplomacy. Negotiating more effective global agreements. New York & Oxford: Oxford University Press.

Tobin, Paul. 2017. Leaders and laggards: Climate policy ambition in developed states. *Global Environmental Politics* 17(4):28–47.

Tosun, Jale. 2012. Environmental monitoring and enforcement in Europe: A review of empirical research. *Environmental Policy and Governance* 22(6):437–448.

Tosun, Jale. 2015. Umweltpolitik. In *Handbuch Policy-Forschung*, eds. Georg Wenzelburger, and Reimut Zohlnhöfer, S. 641–662. Wiesbaden: Springer Fachmedien Wiesbaden.

Tuschhoff, Christian. 2015. Internationale Beziehungen. Konstanz: UKV Verlagsgesellschaft.

UN (United Nations). 1992. United Nations Framework Convention on Climate Change. Accessed in https://unfccc.int/resource/docs/convkp/conveng.pdf. Accessed 10 Nov 2019.

UNFCCC (United Nations Framework Convention on Climate Change). no year. Parties & observers. https://unfccc.int/parties-observers. Accessed 12.03.2019.

von Stein, Jana. 2008. The international law and politics of climate change. Ratification of the United Nations Framework Convention and the Kyoto Protocol. *Journal of Conflict Resolution* 52(2):243–268.

Weaver, R. Kent, and Bert A. Rockman. 1993. Assessing the effects of institutions. In *Do institutions matter government capabilities in the United States and abroad*, eds. R. Kent Weaver, and Bert A. Rockman, 1–41. Washington, D.C.: The Brookings Institution.

Welsch, Heinz. 2004. Corruption, growth, and the environment: a cross-country analysis. *Environment and Development Economics* 9(5):663–693.

World Bank. 2016a. World development indicators 2016. Washington: International Bank for Reconstruction and Development & The World Bank. https://openknowledge.worldbank.org/handle/10986/23969, Accessed 11 May 2016.

World Bank. 2016b. CO_2 emissions (metric tons per capita). http://data.worldbank.org/indicator/EN.ATM.CO2E.PC. Accessed 1 Jan 2016.

World Resources Institute. 2015. CAIT country greenhouse gas emissions: Sources & methods. http://www.wri.org/blog/2015/06/infographic-what-do-your-countrys-emissions-look. Accessed 12 May 2016.

Yamagata, Yoshiki, Jue Yang, and Joseph Galaskiewicz. 2013. A contingency theory of policy innovation: how different theories explain the ratification of the UNFCCC and Kyoto Protocol. *International Environmental Agreements: Politics, Law and Economics* 13(3):251–270.

Zahran, Sammy, Eunyi Kim, Xi Chen, and Mark Lubell. 2007. Ecological Development and Global Climate Change: A Cross-National Study of Kyoto Protocol Ratification. *Society & Natural Resources* 20(1):37–55.

3 International integration and climate commitment and performance

Abstract

Previous empirical studies have not systematically examined the interaction effects between globalisation and domestic political institutions, based on the assumption that the competitive pressures caused by globalisation affect climate commitment and performance, independent of domestic politics. The central argument of this chapter is that it is an empirical question whether the effect of globalisation on climate commitment and performance is independent of domestic factors. To answer the research question, this chapter examines previous research, which asked whether globalisation is good or bad for climate commitment and performance. How does globalisation affect state participation in climate cooperation, and is its effect moderated by domestic political institutions? The discussion suggests that economic openness undermines climate commitment and performance in developing countries via the scale and composition effects of economic growth. In the developed world, a country's climate performance depends on the behaviour of important trading partners. Political globalisation should contribute as a positive incentive to climate commitment and performance. While competition pressures caused by economic globalisation may affect climate commitment and performance, independent of domestic variables, institutional constraints and institutional quality can moderate incentives derived from international political integration, as well as scale effects of economic openness. Based on the broader literature on policy consequences of globalisation three research traditions on the joint effect of globalisation and domestic political institutions are identified: the veto-player approach, the political-corruption and the regime-type approach. The following study examines whether they apply to climate commitment and performance.

Following Chaudoin et al. (2015, pp. 282ff.) there are five possible relationships between domestic and international explanatory factors of (foreign) policy. First, international variables are unimportant for public policy. Second, domestic and international determinants have additive effects on (foreign) policy. Third, international influences affect policy output indirectly, via their effect on domestic explanatory factors (mediation effects). Fourth, a country's policy is influenced by other countries policies via policy-diffusion mechanisms (interdependence). Last, international variables affect the effect of domestic variables or vice versa (moderation effects). This study examines the possible moderation effects of domestic political institutions on the effect of international economic and political integration on climate commitment and performance.

To formulate hypotheses on the moderation effects of domestic political institutions, it is necessary to specify the causal order of domestic and international explanatory factors of climate commitment and performance (see also Chapter 5). The reason is that multiple moderation effects of domestic political institutions are possible. As this chapter will show, they can influence government responses to globalisation as well as their implementation, a government's exposure to international influences, and the growth effects of economic globalisation, via a country's ability to attract international trade and capital. This chapter therefore begins by examining the globalisation/environment literature regarding (3.1) the effects of international economic and (3.2) political integration on climate commitment and performance. Is globalisation good or bad for climate commitment and performance? How does globalisation affect state participation in climate cooperation? Following the conclusions of Chapter 2, this discussion of the empirical literature focuses on studies that examine climate commitment and performance specifically, as results may vary in accordance with the type of environmental problem. The conclusions of both sections (3.1 & 3.2) formulate hypotheses on the relationship between international economic/political integration and climate commitment and performance. Based on the discussion in Chapter 2, separate hypotheses are formulated for UNFCCC and Kyoto Protocol ratification and climate performance, as well as developed and developing countries. The following empirical analysis does not examine climate commitment separately for developed countries (see also Chapter 6). There is little variation in the ratification of the UNFCCC among industrialised countries. Additionally, EU member states entered the Kyoto Protocol together. However, the statistically analysis of climate commitment studies the pooled sample and the developing-country sample separately.

Chapter 3.1 and 3.2 illustrate that there is no uniform effect of globalisation dimensions on climate commitment and performance. Based on previous research, this study assumes that economic openness undermines climate performance of poor countries via composition and scale effects of economic growth. In the developed world, international economic integration influences climate commitment and performance via policy diffusion.

International political integration contributes to climate commitment and, to a lesser extent, performance as a positive incentive derived from the international level.
Second, to situate this research question within the academic literature, Sections 3.1 and 3.2 discuss the literature, asking whether these effects depend on domestic political institutions. Race-to-the-bottom theory suggests that the effect of economic globalisation on climate commitment and performance is independent of domestic political factors. Most empirical explanatory models used in similar studies assume additive effects of international integration. Studies on interaction effects between globalisation and domestic political institutions have focused in part on local environmental problems, based on the assumption that competition pressures affect climate commitment and performance, independent of domestic political institutions (e.g., Cao & Prakash, 2012). This chapter argues that it is an empirical question, not previously studied, whether the effect of international integration on climate commitment and performance is independent of domestic factors. First, the theories underpinning most arguments that link international integration to climate commitment or performance assume that domestic factors (including domestic political institutions) moderate the effects of international integration. Second, as the literature review suggests, no uniform effects of the globalisation dimensions (see above) have been shown. The moderation effects of international integration and domestic political institutions may, therefore, vary among dimensions of international integration. Finally, as mentioned above, this chapter identifies four possible moderation effects. First, political institutions within a government system (i.e., involved in the political decision-making process) moderate state responses to incentives and pressures caused by globalisation. Second, implementation institutions (e.g., environmental authorities) affect the relationship between globalisation and climate performance. Third, domestic political institutions influence a country's exposure to international influences derived from international integration. This includes arguments that domestic and international pressures and incentives on the government can strengthen or weaken each other. Finally, domestic political institutions moderate the effect of economic openness on climate performance via economic growth, as context conditions of international trade and investment. While competition pressures caused by economic globalisation may affect climate commitment and performance, independent of domestic political institutions, institutional constraints and institutional quality can moderate incentives derived from international political integration, as well as scale effects of economic openness. The broader literature on the (environmental) policy consequences of international integration examines the possible moderation effects of domestic political institutions. The conclusion (3.3) distinguishes between three theoretical approaches to the joint influence of globalisation and domestic political institutions: the veto-player approach, the joint effect of globalisation and political corruption, and differences among democracies and autocracies in relation to the effect of international integration. The following study uses these to analyse climate commitment and performance (see Chapter 5).

3.1 International economic integration and climate commitment and performance

This chapter examines the academic literature on international economic integration and climate commitment and performance. The first section (3.1.1) distinguishes between two conceptualisations of international economic integration in the globalisation/climate change literature (economic openness and interdependence), arguing that it is important to consider both conceptualisations. They are associated with different theoretical arguments, which link them to climate commitment and performance. Section 3.1.2 discusses theoretical perspectives on economic globalisation and climate commitment and performance (standard economic theory, globalisation, policy-convergence and diffusion research, and neoliberal institutionalism). Is international economic integration good or bad for climate commitment and performance? How does economic globalisation affect state participation in climate cooperation? Does its effect depend on domestic political institutions? The following section (3.1.3) examines the empirical literature on economic globalisation and climate commitment and performance. For the empirical analysis, the conclusion (3.1.4) formulates hypotheses on the relationship between international economic integration and climate commitment and performance. Based on previous research, this study assumes that economic openness contributes to global air pollution via the scale and composition effects of economic growth in poor countries. International economic integration influences climate performance via policy diffusion in developed countries. This chapter argues that, in contrast to the assumptions that underlie theoretical discussions of economic globalisation and climate commitment and performance, the explanatory models in most empirical studies assume additive effects of international economic influences. From a theoretical perspective, multiple moderation effects of domestic political institutions are possible. While states may react in similar ways to competition pressures caused by economic openness and interdependence, domestic political institutions may moderate the scale effects of economic openness.

3.1.1 Conceptualisation of international economic integration

Social and political scientists disagree on what 'globalisation' means (Jahn, 2016a, p. 861; Jones, 2010, p. 4f.; Rensmann, 2011, p. 106). In the literature on the environmental policy consequences of economic globalisation, two important conceptualisations can be distinguished (see also Jahn, 2016b, p. 239). While many studies refer to the concept of international economic embeddedness[19] (e.g., Boyce, 2004, p. 106; De Soysa & Neumayer, 2005, p. 733; Spilker, 2013, pp. 14–19), other scholars use the economic interdependence concept (e.g., Jahn, 2016b, p. 239; Jahn, 2008, p. 13). The extent to which a country is embedded in the international system is a multidimensional concept (Jahn, 2016b, p. 239). There is no agreement on the dimensions of international embeddedness. Dreher et al. (2008, p. 43) identify economic, political, and social dimensions of globalisation. International economic embeddedness is conceptualised either as economic liberalisation or as economic openness. Economic liberalisation refers to 'the cluster of technological, economic, and political innovations that reduce the barrier to economic, political and cultural exchange' (Drezner, 2005, p. 841). Based on the conceptualisation of international economic embeddedness, a separate literature explores the effect of economic liberalisation (e.g., Morin et al., 2018) and economic openness on the environment (e.g., Gallagher, 2009) (see also O'Neill, 2009, p. 144). In accordance with similar studies of international economic integration and climate commitment and performance, this study focuses on economic openness.

Concepts of economic openness view international economic integration in terms of cross-border economic interactions – goods, services and capital – among countries (e.g., Garrett, 2000, p. 942; Milner & Keohane, 1996, p. 4). A country's economic openness refers to the extent of its economic exchanges of goods, services, and money with other countries, relative to the size of its economy (Becker et al., 2007, p. 13; Jahn, 2009, p. 96; Zürn, 2002, p. 237). The higher the percentage of international economic transactions in a country's GDP, 'the more it interacts with other countries' (Jahn & Stephan, 2015, p. 22) and the higher its exposure to global economic pressures (Babones, 2007, p. 147). Empirical research on internationalisation and globalisation conceptualises international economic integration as economic openness, measured by trade or capital openness (e.g., Garrett, 1998, p. 1; Milner & Keohane, 1996, p. 4) (Gilardi, 2013, p. 455).[20] This also applies to studies of the environmental consequences of economic globalisation (e.g., Spilker, 2013). Policy-convergence studies also apply the economic openness concept (e.g., Drezner, 2005, p. 841), based on the assumption that a country's economic openness implies an exposure to international economic pressures to stay competitive (e.g., Holzinger & Knill, 2005, pp. 782, 789; Holzinger et al., 2008, p. 561). Based on the type of economic interaction, three dimensions of economic openness can be distinguished: international trade, foreign direct investment, and international financial flows (Garrett, 2000, p. 942; Haas & Hird, 2013, p. xxxiii; Mahler, 2004, p. 1028; Zohlnhöfer, 2015, p. 200). The globalisation/environment literature focuses on the first two dimensions (see 3.1.2 & 3.1.3). In more recent research on international economic integration and the environment, the term 'economic globalisation' is often used to denote economic openness. In general, economic-globalisation studies rarely differ, in their conceptualisation and measurement of international economic integration, from earlier studies of the effects of international trade (Babones, 2014, pp. 5, 70).[21,22]

Social science research on economic globalisation and the environment also refers to the 'economic interdependence' concept (e.g., neoliberal institutionalist theory). In International Relations, interdependence refers to situations of 'mutual dependence between social actors' (Zürn, 2002, p. 236) or countries; these are the outcomes of transactions between countries or social actors within different countries (Keohane & Nye, 1989, p. 8f.; Zürn, 2002, p. 236). Thus, economic interdependence refers to mutual dependence between countries, resulting from the exchange of goods, services, and money. In contrast to international economic interconnectedness, mutual dependence implies that countries are affected by economic transactions (Keohane & Nye, 1989, p. 9; Zürn, 2002, p. 236). The degree of economic globalisation can vary between nations (Jahn, 2009, p. 92; Zürn, 1998, p. 76). Race-to-the-bottom theory and race-to-the-top theory refer to the concept of strategic interdependence (Jahn, 2016b, p. 243f.). This understanding refers to situations in which the actions of a 'whenever some unit(s)'s actions affect the marginal utilities of the alternative actions for some other(s)' (Franzese & Hays, 2008, p. 745, see also Cao & Prakash, 2010, p. 482; Lake & Powell, 1999, pp. 7f.). More recently, scholars have studied economic interdependence and the environment from the perspective of the policy diffusion concept (e.g., Jahn, 2016b, p. 239; Jahn, 2006, pp. 402f.). Globalisation is understood as a process through which governments voluntarily adopt the policy innovations (e.g., environmental policies) of other countries (Braun & Gilardi, 2006, p. 299; Braun et al., 2007, p. 39; Busch & Jörgens, 2005, p. 865; Dobbin et al., 2007, p. 457; Elkins & Simmons, 2005, p. 35; Gilardi, 2013, p.

[19] The literature also uses the term 'international economic interconnectedness' (e.g., De Soysa & Neumayer, 2005, p. 733) or 'internationalisation' (e.g., Milner & Keohane, 1996, p. 4).

[20] Outcome data are easier to measure than liberalised trade barriers (Milner & Keohane, 2006, pp. 3f.).

[21] Scholte (2005, p. 17) maintains that '[f]rom this perspective, 'global' is simply another adjective to describe cross-border relations between countries, and 'globalisation' designates a growth of international exchange and interdependence'.

[22] Accordingly, Jahn (2016a, p. 239) describes globalisation as a 'catchphrase' for embeddedness and interdependence.

454; Graham et al., 2012, p. 675; Jahn, 2016a, p. 865; Jahn, 2015, p. 255; Jahn & Stephan 2015, p. 27; Simmons & Elkins, 2004, p. 173; Simmons et al., 2006, p. 792).[23,24] The policy-diffusion literature, based on multiple theoretical traditions, names these 'diffusion mechanisms' (Gilardi, 2013, p. 460); they are common causal mechanisms for the way in which political decisions in other countries influence policy outputs (Braun & Gilardi, 2006, p. 299; Braun et al., 2007, p. 42 Gilardi, 2013, p. 460; Hedström & Swedberg, 1998, p. 7). The diffusion mechanism of 'economic competition' assumes that governments adopt policies derived from other countries to secure economic competitiveness in their own domestic economies (Dobbin et al., 2007, p. 457; Gilardi, 2013, p. 432; Jahn, 2015, p. 255; Jahn, 2016a, p. 865; Jahn, 2016b, p. 244; Jahn & Stephan 2015, p. 27; Simmons & Elkins, 2004, p. 173; Simmons et al., 2006, p. 792). Political authorities are able to identify their competitors, their competitive advantages, and relevant policies (Dobbin et al., 2007, p. 458). Esty (2011, p. 160) assumes that the more a country trades with another country, the more it is influenced by that country's environmental and economic policies. This conceptualisation of international economic integration is similar to the concept of strategic interdependence (Jahn, 2016b, p. 244). In fact, economic globalisation results from economic interdependence (Gilardi, 2013, p. 454; Jahn, 2006, pp. 402f.). Most studies of climate commitment and performance do not restrict international economic integration to interdependence across regions and continents. By contrast, the transformalist definition of globalisation introduced by Held et al. (1999, pp. 7ff., 15)[25] refers to processes of increased interdependence between individuals and societies across regions and continents (Carporaso & Madeira, 2012, p. 8; Held & McGrew, 2000, p. 4; Jahn, 2009, pp. 87f.; Zürn, 1998, p. 125). Carporaso and Madeira (2012, p. 8) argue that '[i]n one sense, globalization is just interdependence (economic, cultural, or political) on a global scale.'

In sum, economic globalisation is understood either as a country's economic openness or as economic interdependence (or policy diffusion) between countries. The next section shows that theoretical approaches link economic globalisation to climate commitment and performance in different ways, depending on their conceptualisation of international economic integration. It follows that it is important to study the effect of both dimensions of economic globalisation on climate commitment and performance.

3.1.2 Review of the main theoretical approaches

This section reviews the main theoretical approaches in the literature on economic globalisation and the environment. Is economic openness good or bad for climate commitment and performance, and is its effect independent of domestic political institutions? The economic globalisation and climate commitment and performance literature refers to the broader theoretical debate on the environmental consequences of economic globalisation, as well as the older debate on the effect of international trade on the environment. This chapter distinguishes between three theoretical traditions in the academic literature (for more on general public policy, see Busch, 2007, p. 27; Schirm, 2007, p. 2). First, economic and political science publications refer to standard trade theory (e.g., Bättig & Bernauer, 2009, p. 296; Jahn, 2008, p. 14; Spilker, 2013, pp. 14ff.). Second, political science research studies the relationship between globalisation and the environment from the perspectives of internationalisation and globalisation, as well as policy convergence and diffusion theory (e.g., Andonova et al., 2007; Yamagata et al., 2013). The relationship between international economic integration and a country's commitment to climate cooperation is rarely discussed from these perspectives.[26] Finally, scholars have drawn on International Relations theory (neoliberal institutionalism) to discuss the consequences of international economic integration for climate commitment.

3.1.2.1 Standard economic theory

Within standard trade theory, scholars draw on empirical research arguments about the impact of economic growth on environmental quality to study the effects of economic openness on environmental quality (O'Neill, 2009, p. 144). The direct and indirect effects of economic openness on the environment are distinguished (Gallagher, 2009, p. 283). The former include greenhouse gas emissions caused by increased international transportation of goods and services (Gallagher, 2009, p. 283; O'Neill, 2009, p. 145). Trade and capital openness are associated with

[23] It can also be applied to other political levels or to non-state actors and is not limited to policies (Gilardi, 2013, p. 454).

[24] The definition of policy diffusion excludes international or supranational law and external coercion (Busch & Jörgens, 2005, pp. 865, 861; Elkins & Simmons, 2005, pp. 35, 38; Gilardi, 2013, p. 454; Jahn, 2015, p. 255). While this limitation of the diffusion concept is contested (e.g., Börzel & Risse, 2009, p. 9; Braun & Gilardi, 2006, p. 299; Dobbin et al., 2007; Graham et al., 2012, p. 690; Holzinger & Knill, 2005, pp. 779ff.; Knill, 2005, p. 767; Simmons et al., 2006, pp. 790f.), it clearly distinguishes policy diffusion from related concepts (Holzinger et al., 2007, pp. 14, 29f.).

[25] Held et al. (1999, pp. 2–10) distinguish this understanding from hyperglobalist and sceptical perspectives. Hyperglobalist conceptualisations are problematic in the analysis of climate policy because they include the results of these worldwide integration processes in their definitions (e.g., Zürn, 2013, p. 402) (Jahn, 2016a, p. 862). In contrast to the sceptical position, the environmental policy literature assumes that international integration processes limit the autonomy of national governments.

[26] One exception is Bättig and Bernauer (2009).

increased greenhouse gas emissions as long as transportation techniques are not environmentally friendly (Gallagher, 2009, p. 283). Following Grossman and Krueger's (1995) article, the literature distinguishes between three indirect effects of international trade and capital openness on the environment: the scale, composition, and technique effects of economic growth (e.g., Gallagher, 2009, p. 283). There is no agreement on the direction of the indirect effects of international trade and investment. International trade and investment increase the scale of economic activity in a country (economic growth) (Cole, 2004, p. 72; Esty, p. 2001, p. 115). If economic production processes are not altered in way that is environmentally friendly, increased trade and investment will make environmental pollution worse (Cole, 2004, p. 72; Copeland & Taylor, 1994, p. 769; Esty, 2001, p. 115; Gallagher, 2009, p. 283). Capital openness increases pollution via economic activity in developing countries, as foreign investment usually focuses on large-scale plants in the global south (Spilker, 2013, p. 17). International trade and investment also contribute to environmental pollution by increasing domestic consumption (Jahn, 2016b, p. 240). By contrast, green political theory assumes that economic openness can contribute, via sustainable development, to environmental quality (Esty, 2011, p. 158). In sum, as greenhouse gas emissions result from major economic activities, **scale effects** imply that trade and capital openness are associated with lower levels of climate performance if production processes and consumption patterns are not altered in an environmentally sustainable way.

Composition effects refer to the Heckscher-Ohlin model and the Stolper-Samuelson theorem of standard trade theory. Countries specialise in economic sectors in which they have a comparative advantage. Thus, international trade and capital generate additional income (Gallagher, 2009, pp. 282f.). Different conclusions are drawn about its impact on the environment. The gains-from-trade hypothesis claims that economic openness contributes to climate performance via economic growth (Baek et al., 2009, p. 2261; Damania et al., 2003, p. 490; Frankel & Rose, 2005, p. 85; Li & Reuveny, 2006, pp. 942f.). Countries with more economic resources should enact and implement environmental protection policies and use more environmentally friendly technologies (Clapp & Dauvergne, 2011, p. 27; Cole, 2004, p. 72; Dauvergne, 2017, p. 398; Esty, 2011, p. 161f.; Gallagher, 2009, p. 283; O'Neill, 2009, p. 145). Moreover, trade and foreign investment improve the environment via employment and poverty reduction (De Soysa & Neumayer, 2005, p. 734; Esty, 2011, p. 161). The gains-from-trade hypothesis is based on the assumption that citizens and the government have an interest in environmental protection. Following Environmental Kuznets Curve (EKC) theory, the higher the levels of economic development, the higher the public demand for environmental quality. This only applies to developed countries. Governments and the public in rich countries, however, often focus on immediate and local environmental problems as well (see Chapter 2). If environmental quality has negative income elasticity (inferior good), gains from trade are associated with a higher public demand for environmental protection; in this way, they lead (via the use of environmentally friendly production technologies) to environmental quality (Baek et al., 2009, p. 2255; Chang, 2015, p. 235; Copeland & Taylor, 1994, p. 755; Dean, 2002, p. 820; Gallagher, 2009, p. 283; Jahn, 2008, p. 14). By contrast, international trade undermines the environment as a normal good (positive income elasticity) via the scale of economic activity (Baek et al., 2009, p. 2255; Chang, 2015, p. 235). Economic growth, based on international trade and investment, contributes via the overconsumption of environmental resources, population growth, and economic inequality, to environmental degradation (Clapp & Dauvergne, 2011, p. 33, 38ff.). This questions the hypothesis that trade and capital openness contribute to climate protection in developed countries.

Standard trade theory regards the economic sector, which gives a country its comparative advantage, as decisive for composition effects (Cole, 2004, p. 72; Jahn, 2016b, p. 240; Spilker, 2013, p. 15). International trade and investment contribute to environmental degradation, if a country's comparative advantage lies in pollution-intensive production or weak environmental regulations (Gallagher, 2009, p. 283). Thus, economic openness has an unequal effect on environment across countries (Dauvergne, 2017, p. 402). The literature distinguishes between poor and rich countries in this respect. Assuming that the comparative advantage of developed countries lies in capital intensive production, while the comparative advantage of developing countries lies in labour-intensive production, economic openness has a negative effect on climate performance in rich countries and a positive effect in poor countries. Labour-intensive production processes are less polluting (Spilker, 2013, p. 15). By contrast, the pollution-haven hypothesis assumes that international trade and investment increase environmental pollution in developing countries (Antweiler et al., 2001, p. 877; Cole et al., 2017, p. 467; Xu, 2000, p. 234). They have a comparative advantage in the export of pollution-intensive goods and primary commodities (e.g., natural resources). Thus, multinational corporations externalise environmental pollution to developing countries by importing pollution-intensive products and raw materials (Boyce, 2004, p. 110). Developing countries may also have a comparative advantage in low environmental standards because they have lower public demand for environmental protection (EKC theory) and their governments have less ability to enforce and implement them (Boyce, 2004, p. 107; Dauvergne, 2017, p. 401). Thus, trade and capital openness undermines climate performance in developing countries by shifting pollution-intensive production to countries with low environmental standards (Cole, 2004, p. 73; Cole et al., 2017, p. 467; Copeland & Taylor, 1994, pp. 767, 769; Copeland & Taylor, 2004, p. 9; Frankel & Rose, 2005, p. 85). Simultaneously, climate protection in developed countries (e.g., Japan, the United Kingdom)

can profit from international trade and investment (Cole et al., 2017, pp. 480f.; Dauvergne, 2017, p. 402)[27]. Theoretical and empirical research suggests that environmental regulations do not increase production costs enough for firms to consider them a reason to relocate (e.g., Antweiler et al., 2001; Boyce, 2004; Copeland & Taylor, 2004; Dean, 2002, p. 820; Tobey, 1990; see also Wheeler, 2001, pp. 231f.). A more recent study, which considers types of foreign direct investment (FDI), finds support for the pollution-haven hypothesis (Tang, 2015). To conclude, international trade and investment, via composition effects, increase greenhouse gas emissions in the developing world. They may improve climate performance in developed countries.

Standard economic theory regards **technique effects** as good for the environment (e.g., Copeland & Taylor, 2004, p. 15). International trade and investment would support the development and distribution of environmentally friendly production processes (Cole, 2004, p. 72; Gallagher, 2009, p. 283; Frankel & Rose, 2005, p. 85). Based on the assumption that technologies are more environmentally friendly in developed countries, trade and especially foreign investment have a positive effect on environmental quality in developing countries (Spilker, 2013, p. 18). Multinational corporations presumably use the technology of their home countries (Frankel & Rose, 2005, p. 85; Spilker, 2013, p. 18). This leads to the diffusion of technology within countries via supply-chain requirements (Spilker, 2013, p. 18). By contrast, case studies have shown that multinational corporations use weaker environmental standards in their host countries than they do in their home countries (Dauvergne, 2017, p. 402). Moreover, they may have little interest in developing techniques that decrease global air pollution (vs. local air pollution). Econometric and case study results are ambiguous (Cole et al., 2017, p. 477f.). In sum, there is unlikely to be a clear effect of technique effects.

In sum, economic openness affects climate performance via scale and composition effects. Scale effects should undermine climate performance. Via composition effects, international trade and investment should increase greenhouse gas emissions in the developing world. They may improve climate policy outcomes in developed countries. Technique effects are ambiguous. The net effect of trade and capital openness depends on which effect (direct, scale composition, technique) dominates (e.g., Copeland & Taylor, 2004, p. 9; Spilker, 2013, pp. 16f., 19). Thus, the effect of international trade and investment on climate performance (see also Chang, 2015, p. 235; Li & Reuveny, 2006, p. 943) is an empirical question (Bättig & Bernauer, 2009, p. 296; Spilker, 2013, pp. 17, 19). The negative scale and composition effects of international trade and investment suggest that trade and capital openness should undermine climate performance in developing countries. By contrast, there should be no clear effect in developed countries (negative scale effects, unclear composition effects). Although standard trade theory does not address the ratification of international climate agreements, composition effects can be used to explain the ratification of international agreements (e.g., Bättig & Bernauer, 2009). Developing countries that profit from pollution-intensive trade and investment should be less committed to climate cooperation than developed countries.

Standard economic theory tells us little about the interrelationship between economic openness and domestic politics. The gains-from-trade hypothesis assumes that citizens prefer environmental protection and that governments use revenues from international trade and investment to protect the environment. Empirical research has shown that public concern about global warming varies among countries (e.g., Kim & Wolinsky-Nahmias, 2014). It is therefore an empirical question whether governments use trade revenues to protect the global atmosphere.

Work has been carried out, from the perspective of standard trade theory, on possible interactions between domestic political institutions and economic openness. First, Cole and Fredriksson (2009) have argued that the negative effect of capital openness is higher in countries with few veto points. Foreign firms lobby the government to reduce environmental regulations. The higher the number of veto points, the more costly this becomes. Yet, environmental protection may also become more important as the number of veto points rises (see Chapter 5).

Second, economists expect corruption among political decision-makers and public authorities to strengthen the negative effects of economic openness on global air pollution (Chang, 2015; Damania et al., 2003). More corrupt governments are more likely to reduce environmental regulations or fail to implement them, reflecting their business interests, under conditions of economic globalisation (Chang, 2015, pp. 235f.). Damania et al. (2003, pp. 492f.) assume that corruption enhances the negative effect of trade liberalisation on the stringency of environmental policy in the case of protective trade policies. It shifts the government's focus away from social welfare toward bribery (Damania et al., 2003, p. 493).

Finally, Spilker (2013, pp. 54f., 58ff.) argues that democracy lessens the negative effects and strengthens the positive effects of international trade and investment on environmental quality in developing countries – for three reasons. First, local communities in democracies have more opportunities to pressure firms to implement environmental regulations. Political rights enable them to protest against firm decisions, pressure political decision-makers, and mobilise public support via the media. Civil rights make it possible to enforce environmental regulations through the courts. Transparency also supports the work of courts. Second, citizens in democracies are more informed about environmental problems and, therefore, are better able to monitor environmental policy adoption

[27] The pollution-haven hypothesis is compatible with the regulatory race and race-to-the-bottom hypothesis (Gallagher, 2009, p. 283) (see the next section).

Figure 3.1 International economic integration, the government system, and climate policy output and outcome

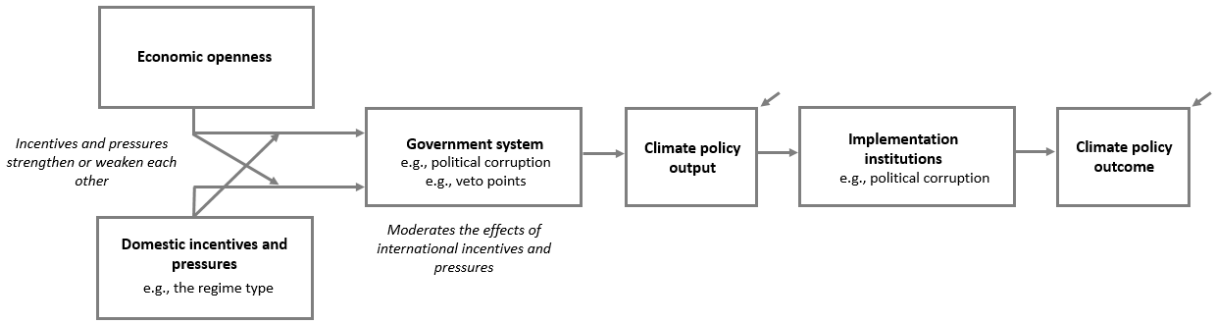
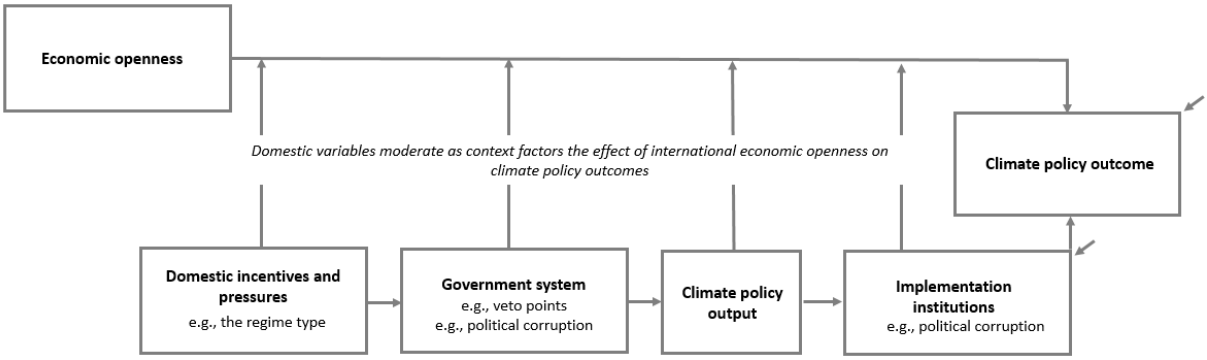


Figure 3.2 Economic openness, domestic political institutions, and climate policy outcome



and implementation. Finally, the rule of law, including property rights, enables firms to invest in environmentally friendly technologies. The literature formulates multiple moderation effects. First, characteristics of the government (veto points and political corruption among political decision-makers) moderate the effect of economic openness on climate policy output (e.g., Chang, 2015; Cole & Fredriksson, 2009; Damania et al., 2003) (see Figure 3.1). Second, domestic political institutions (political corruption among public officials, rule of law, civil rights), which implement climate policy outputs, affect climate policy outcomes (climate performance) (e.g., Chang, 2015; Damania et al., 2003) (see Figure 3.1). Third, domestic political institutions that control access to the political system (e.g., political rights) act as incentives, influencing government responses to pressures of international integration (e.g., Spilker, 2013) (see Figure 3.1). Finally, domestic political institutions moderate (as context factors of international trade and investment) their effects on climate performance through economic growth (see Figure 3.2). For instance, civil rights lead firms to invest in environmentally friendly technology (Spilker, 2013, p. 59).

To conclude, standard economic theory argues that trade and capital openness undermine climate commitment and performance in the developing world, through scale and composition effects. There is no clear effect of economic openness in the developed world. Does the effect of international economic integration depend on domestic political institutions? While standard economic theory does not address this question, several studies have suggested that the effect of economic openness on the environment depends on the level of political corruption, regime type, and veto points.

3.1.2.2 Globalisation, policy-convergence and policy-diffusion research

This chapter discusses three strands in the academic literature on international economic integration and the environment: (1) a debate on the policy consequences of internationalisation or globalisation; (2) policy-convergence research; and (3) policy-diffusion research. These research traditions share assumptions and concepts regarding the (environmental) policy consequences of international economic integration and the interrelationship between international and domestic explanatory factors. Newer research traditions refer to older ones, adopting and refining their assumptions and concepts (see also Gilardi, 2013, pp. 454f.). The debate about the policy consequences of internationalisation goes back to the 1970s and has recently been applied to globalisation. Policy-convergence research generated fears that globalisation could lead to a race-to-the-bottom in social and environmental policy; it led to the discovery of an increasing similarity in policy outputs (e.g., Wheeler, 2001) in certain policy fields across spatial units (e.g., countries) over time (Drezner, 2001, p. 53; Holzinger & Knill, 2005, p. 776; Holzinger et al., 2008, p. 556; Holzinger et al., 2007, p. 11; Kerr, 1983, p. 3). More recently, policy-diffusion research has

addressed the consequences of globalisation for climate performance (e.g., Jahn, 2016b; Jahn, 2008). As explained in Section 3.1.1., policy diffusion is understood to be the result of international interdependence as 'political decisions in a given country are systematically conditioned by prior policy choices made in other countries' (Gilardi, 2013, p. 454) (Holzinger et al., 2007, p. 14; Simmons et al., 2006, p. 787). Policy-diffusion and convergence research assume that policy outputs are influenced by political decisions made by foreign governments (Dobbin et al., 2007, p. 450; Gilardi, 2013, pp. 453–457; Graham et al., 2012, p. 676; Simmons et al., 2006, pp. 782, 787). In contrast to policy convergence, policy diffusion refers to a process, i.e. the spread of policies, not the outcome of this process[28] (Elkins & Simmons, 2005, p. 36; Gilardi, 2013, p. 454). The increasingly similar policy outputs across countries may reflect policy diffusion (Busch & Jörgens, 2005, p. 864; Holzinger & Knill, 2005, p. 779; Gilardi, 2013, p. 454; Knill, 2005, p. 767). This section begins by discussing the effect of international economic integration on climate commitment and performance within these theoretical traditions. Next, it addresses their assumptions and conclusions, regarding the interrelationship between international economic and domestic political explanatory factors.

International economic integration and climate commitment and performance

Scholars of internationalisation and globalisation, policy convergence, and diffusion research refer to the same theoretical approaches when discussing the effect of international economic integration on policy output: standard trade theory (see Chapter 3.1.2.1) and regulatory competition theory (Schirm, 2007, p. 29). The most prominent theoretical approach in regulatory competition theory is race-to-the-bottom theory[29]. Following its central hypothesis, governments lower their environmental standards below the level of their trading partners or competitors. Scholars who study structural factors regard economic interdependence as a form of pressure on firms and governments to stay competitive (Becker et al., 2007, p. 16; Garrett, 1998, p. 2; Holzinger & Knill, 2005, p. 782; Schirm, 2007, p. 8; Wheeler, 2001, p. 221). Environmental regulations are assumed to increase production costs (Drezner, 2001, p. 58; Holzinger & Knill, 2005, p. 782; Kelemen, 2000, p. 140; Wheeler, 2001, p. 221). International economic integration implies mobility of trade and capital, causing companies to transfer their production processes to countries with weaker environmental standards to avoid higher costs (Copeland & Taylor, 2004, p. 9; Drezner, 2001, pp. 57f.; Holzinger & Knill, 2005, p. 782). In addition, industry representatives pressure governments to modify their policies to increase the competitiveness of domestic industry (Holzinger et al., 2008, p. 560). Governments act in accordance with business interests. First, the incongruity between the international economy and the nation-state means that no country can regulate the international market (Drezner, 2001, p. 58). Thus, each government's autonomy, effectiveness, and ability to enact and implement policies is undermined by international economic integration (e.g., Cerny, 1995, p. 597; Garrett, 1998, pp. 7f.; Zürn, 2002, pp. 239f.). Consequently, economic globalisation reduces a government's ability to reduce environmental pollution (Cerny, 1995, pp. 610ff.; Drezner, 2001, p. 59). Second, governments are concerned about the short-term competitiveness of their economies, as economic growth affects their re-election prospects, via their tax base and economic outcomes (e.g., unemployment) (Bernauer & Caduff, 2004, p. 100; Dobbin et al., 2007, p. 458; Drezner, 2001, p. 58; Garrett, 1998, p. 7). Regulatory competition theory assumes that policies, such as environmental regulations, affect a country`s economic competitiveness in the short or medium term (Simmons et al., 2007, pp. 792f.). In accordance with company demands to lower environmental standards (Holzinger & Knill, 2005, p. 782; Tosun, 2015, p. 654), governments adopt market-friendly policies, i.e. reduce public spending and taxes to attract mobile capital (Garrett, 1998, p. 2). As governments know how policy decisions in other countries affect their competitiveness (Simmons et al., 2007, p. 793), they regard themselves as dependent (in their environmental regulations) on the environmental policies of other countries (Cao & Prakash, 2010, p. 482). They are expected to mutually adjust (Holzinger & Knill, 2005, p. 782), i.e. they do not raise ('regulatory chill' Bernauer & Caduff, 2004, p. 100) or lower environmental regulations to stay competitive (Bernauer & Caduff, 2004, p. 100). In extreme cases, this could cause countries to converge on the level of environmental protection of the country with the lowest level of state regulation (race-to-the-bottom) (Bernauer & Caduff, 2004, p. 100; Drezner, 2001, p. 59; Gallagher 2009, p. 290; Holzinger & Knill, 2005, p. 782).

From this perspective, economic openness – because it involves greater exposure to competition pressures (e.g., Holzinger et al., 2008, p. 561; Jahn, 2008, p. 14) – and economic interdependence (as countries react strategically to the climate policies of important trading partners) result in a lower climate performance. Race-to-the-bottom theory has also been applied to environmental cooperation. Neumayer (2002, p. 817) argues that concerns about economic competitiveness can undermine climate commitment. He cites US policy toward the Kyoto Protocol. Harrison and Sundstrom (2010a, p. 19) argue that 'business opposition is likely to be enhanced to the extent that a country's key trading partners do not make comparable commitments to reduce emissions.' Esty (2011, p. 159) argues that, while governments may not lower environmental standards, they may hinder their implementation and

[28] However, it has also been defined as a policy outcome (e.g., Knill, 2005, p. 768).

[29] It is also called the efficiency hypothesis (e.g., Zohlnhöfer, 2015, p. 201) or the regulatory race hypothesis (e.g., Cao & Prakash, 2012, p. 66).

enforcement to make the domestic economy more competitive. It is harder for the public to control and monitor climate policy outcomes than output. Thus, economic globalisation has a stronger effect on climate performance than on commitment.

The race-to-the-bottom hypothesis has been contested. First, its conclusion is questioned (Jänicke, 1998, p. 334f.). Increased international economic exchange and competition have not led to a systematic reduction of environmental regulations (Schirm, 2007, p. 10), especially in developed countries (Vogel, 2000, pp. 265f.). Stricter environmental standards can be a competitive advantage, as well as a condition for market access (Dauvergne, 2017, pp. 399f.). Higher exposure to the international economy or stricter environmental standards among trading partners can even lead, via multilateral trade agreements (Schirm, 2007, p. 10) and exports, to countries adopting higher environmental standards (Cao & Prakash, 2010, p. 488; Vogel, 2000, p. 268; Vogel, 1995, pp. 248–270), as well as innovative (Jänicke, 1998, pp. 334f.; Jänicke; 2005, p. 134) and stricter (Vogel, 2000, p. 268) environmental regulations (see also Cao & Prakash, 2010, p. 488; Jahn, 2008, p. 14). A race-to-the-top, especially with regard to product standards, i.e. '[t]echnical specifications for a certain product' (Knill et al., 2008, p. 1021) (e.g., CO_2 emission limits for cars, Holzinger et al., 2008, pp. 561) is also possible (the 'California effect', Vogel, 2000, p. 269, 275). Several publications have argued that this effect depends on trade barriers and international and supranational policies (Holzinger & Knill, 2005, p. 790; Knill et al., 2008, pp. 1021f.). The spread of OECD standards among countries leave firms with no alternative (Jänicke, 1998, p. 340). Jänicke (1998, pp. 335, 341f.) maintains that the race-to-the-top hypothesis may not apply to environmental problems that cannot easily be solved using technological solutions (such as global warming). As the previous section explained, the assumption that environmental regulations are decisive for plant location is an empirical question. Theories differ on whether policy convergence is caused by structural economic factors, such as race-to-the-bottom theory, or by ideational factors (Drezner, 2001, pp. 55, 57). Assuming that ideational factors are involved, governments may still perceive environmental standards as an obstacle to economic competitiveness (Conca, 2000, p. 486). In fact, Porter (1999, p. 135) has observed that many political decision-makers, bureaucrats and firms in rapidly-industrialising countries perceive them as harming competitiveness. Third, developed countries are able to condition trade with developing countries on the introduction of stricter environmental policies, which are demanded by their own populations (Drezner, 2005, p. 856; Knill et al., 2008, pp. 1020, 1022). Developing countries may not implement them because their competitive advantage lies in few environmental regulations (Knill et al., 2008, p. 1020). Thus, economic globalisation can still undermine climate performance in poor countries. Finally, Wheeler (2001, pp. 232f.) argues that local communities and non-government organisations (NGOs) contribute to environmental protection despite the lack of environmental standards (see also the so-called compensation hypothesis, e.g., Zohlnhöfer, 2015, p. 202). He emphasises, based on previous empirical research, that this does not apply to greenhouse gas emissions 'that have no direct impact on the emitting society' (Wheeler, 2001, p. 238).

In sum, the literature review suggests that there is no general race-to-the-bottom in climate commitment and performance. Economic openness and interdependence imply positive incentives, as well as negative pressures on government climate-protection efforts. The discussion suggests that the negative effects of economic openness may be more prevalent in developing countries. Second, policy diffusion is more important in highly integrated developed countries. Third, economic openness and policy diffusion are more important to climate performance than to climate commitment.

International economic integration and domestic political institutions

Regulatory competition theory argues that the effect of international economic integration is independent of domestic politics, including government ideology and political institutions (Doyle 2014, p. 703; Drezner, 2001, p. 58; Knill et al., 2008, p. 1022; Pinto, 2013, p. 1). Governments follow business interests to secure economic competitiveness (Drezner, 2001, p. 58; Knill et al., 2008, p. 1022). This assumption is contested within the globalisation, policy convergence, and policy-diffusion literature (Jahn, 2016b, p. 240; Drezner, 2001, pp. 55ff.; Wilson, 1996). It cannot explain why states respond in different ways to competitive pressures (policy divergence) (Drezner, 2005, pp. 841f.; Eckersley, 2004, p. 69; Simmons, 2001, p. 590) and sometimes choose environmental protection (Jahn, 2016b, p. 240). For instance, New Zealand's decision to ban future oil exploration (Aigne Roy, 2018).

Gourevitch (1978, pp. 882f., 900, 911) argued, in a seminal article that introduced second-image theory that, while international factors, restricted domestic politics, governments could still choose among different policy choices. The more recent globalisation, policy convergence, and diffusion literatures share this assumption (Drezner, 2005, pp. 841f.; Drezner, 2001, p. 57; Garrett, 1998; Grande, 2012, pp. 189f., 194f.; Jahn, 2009, p. 95; Simmons, 2001, p. 590). In particular, economically powerful states with large domestic markets still have agency under conditions of international economic integration (Drezner, 2005, p. 842). Globalisation itself is the result of political decisions (e.g., Grande, 2012, p. 189).

Second-image-reversed theory, policy convergence, and diffusion theory claim that domestic politics moderate the effect of international economic integration. According to second-image theory, international integration limits government options and influences public policy indirectly, via the policy preferences of the winners and losers

of globalisation (Milner & Keohane, 1996, p. 4). Milner and Keohane (1996) have argued that domestic political institutions moderate both effects. Domestic political institutions may hinder that citizens feel consequences of international economic integration (e.g., as price changes by trade barriers) (Milner & Keohane, 1996, p. 21). Moreover, the political institutional context affects the ability of domestic interest groups to influence government behaviour (Milner & Keohane, 1996, pp. 5, 9f.). Party systems may hinder the access of losers or winners from internationalisation to the political system (Milner & Keohane, 1996, pp. 21f.). Garrett and Lange (1996, pp. 49f., 52ff.) emphasize 'socioeconomic institutions' (e.g., trade unions, corporatism) and 'formal institutions' (e.g., regime type, electoral rules, veto players) and the centralisation of the bureaucracy. Domestic institutions can affect the policy options of governments reacting to internationalisation (e.g., independence of the central bank) (Milner & Keohane, 1996, p. 22). Figure 3.3 presents the argument of second-image theory. This figure does not include climate performance, as the dependent variable of second-image theory is foreign-policy output. Climate performance is defined in Chapter 2 as the climate policy outcome. This study applies the assumptions of second-image-reversed theory to climate commitment and performance, on the assumption that climate policy output affects climate performance.

Policy convergence theory assumes that domestic politics leads to policy divergence under conditions of economic globalisation (e.g., Doyle, 2014, p. 704; Garrett, 1998, pp. 3ff.). Similarly, policy diffusion theory assumes that the effect of economic interdependence is filtered by domestic variables, including political institutions (e.g., the government) and the domestic context (Braun et al., 2007, p. 50; Jahn & Stephan, 2015, p. 34; Neumayer & Plümper, 2012, p. 823). Graham et al. (2012, p. 696; emphasis in original) describe this as 'the *conditional* nature of policy diffusion' (see also Neumayer & Plümper, 2012, p. 820). Therefore, economic globalisation does not necessarily lead to policy convergence (Braun et al., 2007, p. 50). How do domestic politics moderate the effect of economic globalisation? Policy convergence and policy diffusion theory argue that the domestic political decision-making process influences government responses to globalisation, while the domestic context moderates a country's responsiveness to policy diffusion (Braun et al., 2007, p. 50; Jahn & Stephan, 2015, p. 34; Neumayer & Plümper, 2012, p. 823) (see Figure 3.4)[30]. Zohlnhöfer (2007, p. 46) maintains that globalisation-induced changes in domestic policies must be accepted in the domestic political decision-making process. Governments under conditions of globalisation that are aiming for re-election may not respond to international pressures (Zohlnhöfer, 2005, p. 46; Zohlnhöfer, 2003, p. 61). Thus, the political decision-making process, i.e. the policy preferences of political decision-makers and political institutions, filters the influence of economic globalisation (Doyle, 2014, p. 704; Jahn, 2013, p. 365; Jahn & Stephan, 2015, p. 33; Zohlnhöfer, 2015, p. 206; Zohlnhöfer, 2005). In addition to international economic pressures, the government considers its own policy preferences and societal pressures to stay in power (Cao & Prakash, 2012, p. 6; Graham et al., 2012, p. 685; Neumayer & Plümper, 2012, p. 823). Garrett (1998, p. 4) argues that the negative consequences of globalisation lead to domestic pressures to mitigate them. In developing countries, less policy divergence is expected, as labour movements and left-wing parties are weaker in those societies (Doyle, 2014, p. 704). Figure 3.4. presents the theoretical assumptions of the policy-convergence and diffusion literature. As second-image theory, policy-convergence and diffusion research studies policy output. This study applies it to climate performance, on the assumption that climate policy outputs affect climate performance.

[30] Drezner (2005, p. 843) also argues that domestic politics is decisive in the context of trade and investment. This is the argument made from the perspective of standard trade theory – that domestic political institutions moderate the effect of economic openness via economic growth (see Section 3.1.2.1).

Figure 3.3 The joint effectof domestic political institution and economic openness, based on second-image theory

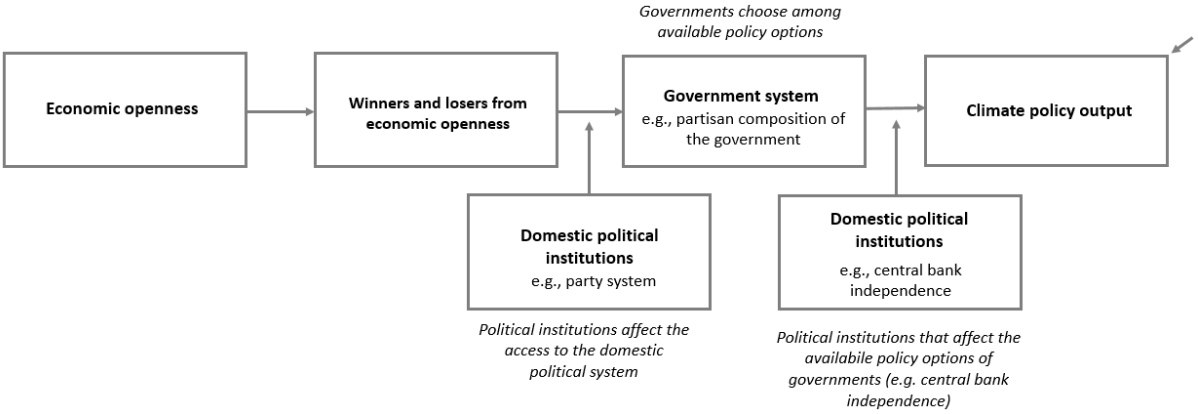
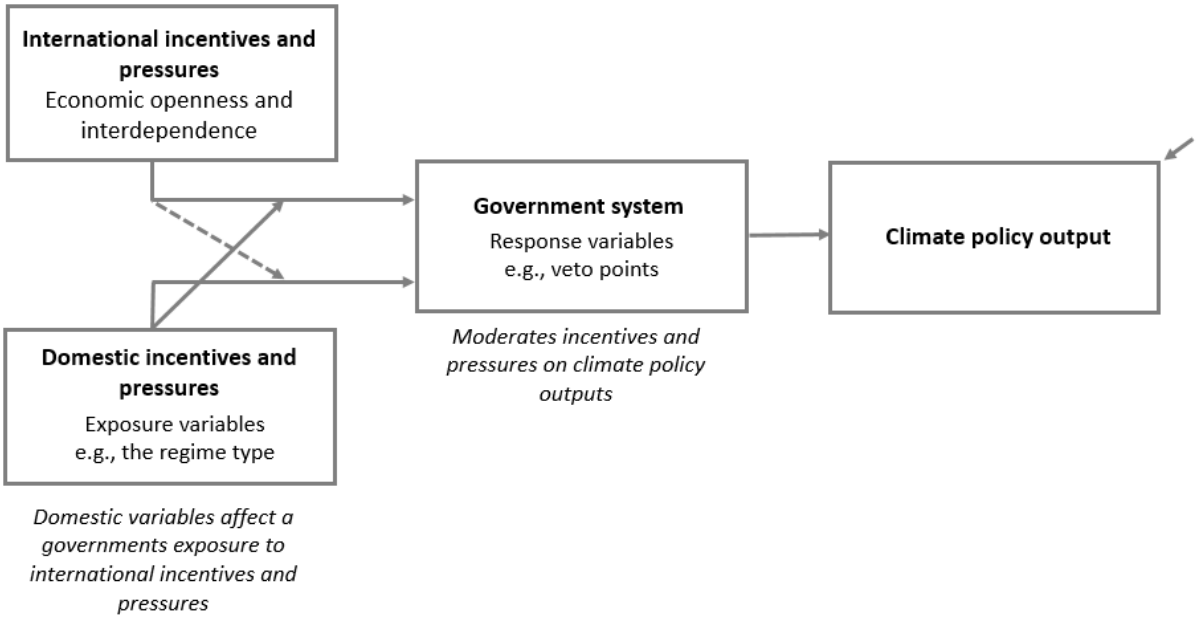


Figure 3.4 The joint effect of domestic political institutions and international economic integration, based on the policy-convergence and diffusion literature



Notes: The dashed arrow indicates that international explanatory factors might also strengthen or weaken the influence of domestic determinants.

There is no agreement on which domestic political factors matter (Graham et al., 2012, pp. 696f.; Zohlnhöfer, 2015, p. 207; Zohlnhöfer, 2005, p. 47). Two groups of variables that moderate the effect of policy diffusion and convergence can be distinguished (Holzinger et al., 2007, pp. 30f.): The cultural, economic, political-institutional, economic, and social context (Jahn & Stephan, 2015, p. 34; Neumayer & Plümper, 2012, p. 820f. 823) and characteristics of the policies themselves (e.g., policy-styles, path dependence) (Schirm 2007, p. 31). Multiple domestic political factors have been identified. Jahn and Stephan (2015, p. 34) distinguish exposure variables, such as democracy (e.g., Holzinger et al., 2007, p. 30) and response variables, such as the policy preferences of the government and political parties (e.g., Jahn & Stephan, 2015, p. 34; Garrett, 1998; Graham et al., 2012, pp. 685f.; Holzinger et al., 2007, p. 30), political institutional constraints (e.g., Grande, 2012, p. 195; Jahn and Stephan, 2015, p. 34) and the capabilities of political actors to adopt and implement policies (Garrett et al., 2012, pp. 685f.). Grande (2012, p. 195) also regards political-strategic factors (e.g. international environmental treaties) as relevant.

Few theoretical approaches explicitly address the interrelationship between policy-diffusion mechanisms and domestic (political) factors (Braun et al., 2007, p. 44). A theoretical approach, which has also been applied to environmental outcomes (e.g., Cao & Prakash, 2012), uses veto player theory to explain state responses to economic globalisation (Zohlnhöfer 2005; see also Ha, 2008). Zohlnhöfer (2005, p. 4; Zohlnhöfer, 2013, p. 377) argues that policy changes designed to adapt to economic globalisation require politically binding decisions. Individual and collective political actors can block policy changes (Zohlnhöfer, 2005, p. 48). Thus, in any analysis of the policy consequences of economic globalisation, the political-institutional context must be considered (Zohlnhöfer, 2005, p. 44). Based on veto player theory, he considers the number and ideological heterogeneity of veto players (Zohlnhöfer, 2007, p. 46). Zohlnhöfer (2005) also argues that the conditions must be identified under which veto players accept policy reactions to economic globalisation (Zohlnhöfer, 2013, p. 377; Zohlnhöfer, 2005, p. 48). He assumes that the government aims to stay in power and realise its policy preferences. As most veto players in established democracies are political parties, their preferences can be captured by party-difference theory (Zohlnhöfer, 2007, p. 46; Zohlnhöfer, 2005, p. 51). Political parties want to realise their policy preferences and maximise their voters (Zohlnhöfer, 2007, p. 46). Institutional veto players restrict the ability of parties in government to realise their policy preferences (Zohlnhöfer, 2007, p. 50). Domestic politics become especially important if the consequences of globalisation can impact re-election (Zohlnhöfer, 2003, p. 61). In sum, the number and ideological heterogeneity of institutional and partisan veto players and their policy preferences moderate the effect of international integration.

Porter (1999) argues that regime type and corruption can explain the relatively high environmental regulations in developed countries and the low standards in developing countries. He argues that trade competition is more influential in low-standard and rapidly-industrialising countries than in high-standard OECD countries. Governments of rich countries refuse to lower environmental standards, reflecting the policy preferences of their citizens (Porter, 1999, p. 138). Environmental regulations have gained political legitimacy over time. By contrast, developing countries are more responsive (via corruption) to opponents of environmental protection. Although many poor people would prefer environmental quality, they have no access to the political system or little influence (Porter, 1999, pp. 141f.; see also Vogel, 2000, p. 276f.). Thus, developing countries are ‘stuck at the bottom’ (Porter, 1999, p. 134). Vogel (2000, pp. 276f.) also stresses government ineffectiveness.

In sum, second-image-reversed theory, globalisation research, and the literature on policy convergence and diffusion argue first that the domestic political decision-making process moderates government responses to globalisation (response variables). Second, the domestic context shapes the exposure and responsiveness of the government to international incentives and pressures (exposure variables). Multiple domestic political institutional variables are identified as relevant to the effect of international economic integration on public policy. Previous comparative environmental policy research has discussed the importance of veto players, political corruption, and regime type.

Conclusions

The literature on the policy consequences of internationalisation and globalisation, policy convergence, and diffusion suggests that there is no general race-to-the-bottom in climate commitment and performance. Policy diffusion is understood to be an international economic incentive or pressure imposed on government behaviour. Economic openness is conceptualised as an exposure to such influences. Competition pressures caused by economic openness undermine climate commitment and performance in developing countries. Policy diffusion from economic interdependence is more important in highly integrated and developed countries. The direction of this effect is an empirical question. Moreover, as it is harder for the public to control and monitor environmental policy outcomes than output, policy diffusion is more important for climate performance than the ratification of climate treaties. In contrast to race-to-the-bottom theory, most theoretical perspectives believe that domestic political explanatory factors moderate the effect of economic openness and interdependence. First, political institutions involved in the domestic political decision-making process moderate government responses to globalisation. Second, domestic political institutions influence government exposure to international economic incentives and pressures. In contrast to the broader literature on environmental consequences of globalisation, few studies have explored the joint effect of economic globalisation and domestic political institutions on climate commitment and performance.

3.1.2.3 Neoliberal institutionalist foreign-policy theory

The relationship between international economic integration and climate commitment has also been studied from the perspective of neoliberal institutionalism (e.g., Bernauer et al., 2010; Ruoff, 2009; Spilker, 2012). The related foreign policy version of this theory identifies explanatory factors of a cooperative foreign policy. States are regarded as rational actors, which compare costs and benefits and aim to realise their self-interest (absolute gains) (Barkdull & Harris, 2002, p. 70). Countries follow a cooperative foreign policy when it reflects their exogenous self-interest (Barkdull & Harris, 2002, pp. 70f.). For instance, countries are expected to strive for economic growth (Barkdull & Harris, 2002, p. 71).

Following neoliberal institutionalism, the international system is characterised by interdependence and anarchy, i.e. the lack of a central authority at the international level (Rittberger et al., 2010, p. 88). Uncertainty, as a consequence of anarchy, makes international cooperation unlikely. However, economic interdependence implies that states depend on international coordination to realise their self-interest; it therefore, contributes to a cooperative foreign policy (Beach, 2012, p. 48; D'Anieri, 2012, p. 79; Harnisch, 2013, p. 419f.; Keohane & Nye, 1989; Rittberger et al., 2010, p. 89, Spindler, 2010, p. 111). In addition to economic interdependence, this study also considers economic openness (Beach, 2012, p. 48). Within this perspective, scholars expect economic openness and interdependence to contribute to climate cooperation (e.g., Bernauer et al. 2010; Fredriksson & Gaston, 2000; Spilker 2012; Ruoff 2009). Countries join environmental agreements to avoid reputation costs, i.e. a negative impact on trade relationships (Fredriksson & Gaston, 2000, pp. 355f.; Hoel & Schneider, 1997, p. 155; Neumayer, 2002, p. 816). For instance, Russia ratified the Kyoto Protocol, in exchange for EU member states supporting its WTO membership. This argument may apply less to developing countries because they have lower reputation costs (Fredriksson & Gaston, 2000, p. 355; Hoel & Schneider, 1997, p. 155)

The standard explanatory model of neoliberal institutionalist foreign-policy theory assumes that state preferences are independent of the domestic political process (Barkdull & Harris, 2002, p. 71). Thus, domestic political institutions do not contribute to the effect of economic globalisation on foreign policy (Beach, 2012, pp. 47, 49; Spindler, 2010, pp. 107, 118). Nonetheless, neoliberal institutional theorists acknowledge that domestic politics are more important for environmental cooperation than for security and trade-related policies (Purdon, 2015, p. 4). Purdon (2015, p. 4) argues that domestic politics are important for climate commitment, as solving global warming depends on changing domestic policies. Similarly, Peters (2007, p. 821) maintains that interdependence influences government behaviour only as an incentive. Government responses depend on the domestic and foreign political decision-making processes.

Conclusions

Neoliberal institutionalist theory suggests that economic openness and interdependence incentivise countries to ratify international climate agreements, which support trade cooperation via issue linkage. Because of their lower reputation costs, this effect is less important for developing countries. International economic incentives to cooperate at the international level are less important for climate performance. It is harder for the international community to control the implementation of international treaties. While most theorists nowadays agree that domestic politics moderate the influence of international economic integration, little work has been done from the perspective of neoliberal institutionalism.

3.1.2.4 Conclusions

This section summarises the discussion of the theoretical literature and considers differences in treaty design between the UNFCCC and Kyoto Protocol (see Chapter 2).

Is international economic integration good or bad for climate commitment and performance? How does economic globalisation affect state participation in climate cooperation? From a theoretical perspective, economic openness and interdependence have both positive and negative effects on **climate commitment**. Following standard economic theory, economic openness (via composition effects) has no clear effect on developed countries. From the perspective of the literature on globalisation, and policy convergence and diffusion, economic openness and interdependence should undermine UNFCCC and Kyoto Protocol ratification in the developed world, through competition pressures on government behaviour. This may be more important for the Kyoto Protocol, which includes binding emissions targets for rich countries. However, the conclusions of Chapter 2 suggest that the targets of the Kyoto Protocol only involve considerable climate change mitigation efforts for some countries. Simultaneously, following neoliberal institutionalist theory, economic openness and interdependence provide an incentive for countries (especially developed countries) to join international climate agreements by supporting trade cooperation via issue linkage. This argument applies more clearly to the soft UNFCCC. In sum, there is no clear effect of economic openness and interdependence on UNFCCC ratification or Kyoto Protocol ratification in developed countries.

According to standard economic theory, economic openness undermines the climate commitment of developing countries through the composition effects of economic growth, as they profit from pollution-intensive trade (pollution-haven hypothesis). According to neoliberal institutionalism, reputational concerns derived from economic

globalisation hardly matter to poor countries. Thus, economic openness can undermine UNFCCC and Kyoto Protocol ratification in the developing world. There is no effect of economic interdependence on UNFCCC and Kyoto Protocol ratification. Developing countries are not expected to reduce greenhouse gas emissions. For this reason, competition pressures are of little importance to their ratification behaviour.

Trade and capital openness have two effects on **climate performance**. First, they affect global air pollution through economic growth. Based on the discussion in the literature, trade openness is likely to undermine climate performance in developing countries through negative scale and composition effects. In contrast to scale effects, composition effects may positively affect climate performance in developed countries, which shift pollution and labour-intensive production to developing countries. There is thus no clear effect of economic openness on climate outcomes via economic growth in rich countries. Second, economic openness is likely to affect the climate performance of developed countries via international economic pressures. No overall effect of economic openness is expected, however, as the effects of the exposure to such influences and economic-growth effects can balance each other out. With regard to policy diffusion, a country's climate policy is assumed to depend on the policies of its main trading partners (Esty, 2011, p. 160) and competitors. The direction of this effect is unclear. There are positive and negative market pressures on climate protection. In general, the potential effects of policy diffusion have more impact on climate performance than on commitment. While Jahn (2015, pp. 255f.) draws on empirical research to argue that the adoption of environmental policies is more likely to spread across countries than the implementation of those policies, interest groups and the public find it difficult to control the implementation of climate treaties (Cao & Prakash, 2012, pp. 70ff.). There is likely to be no effect of policy diffusion on climate performance in developing countries, as the climate regime allows them to focus on economic development.

Does the effect of international economic integration depend on domestic political institutions? Four possible moderation effects have been identified. First, government responses to the incentives and pressures of economic openness and interdependence depend on the domestic political decision-making process (e.g., veto players). Second, institutions responsible for implementation moderate the effect of economic globalisation on climate performance. Third, domestic political institutions, which refer to vertical accountability and thus affect a county's exposure to international influences (e.g., political rights), may strengthen or weaken the incentives and pressures caused by economic openness and interdependence. Finally, domestic political institutions influence (as context factors) the effect of international trade and investment, via economic growth, on climate performance. While race-to-the-bottom theory assumes that competition pressures caused by economic openness and interdependence affect climate commitment and performance, independent of domestic political institutions, institutional variables can moderate the scale and composition effects of trade and capital openness on climate performance. Little systematic work has investigated the joint influence of political institutions and international economic integration on climate commitment and performance.

3.1.3 Empirical research

While empirical research on international economic integration and climate performance mainly employs quantitative methods, the literature on economic globalisation and treaty ratification consists of case studies, as well as statistical analyses. The case studies focus on developed countries ratifying the Kyoto Protocol (with few exceptions). This research finds that economic interdependence can explain the ratification behaviour of Australia and the US (Harrison, 2010; Harrison & Sundstrom, 2007; 2010b, p. 277). Australia withdrew from the treaty, while the US never ratified it (Harrison & Sundstrom, 2007, p. 12). Many developed countries had concerns about economic competitiveness. However, especially policymakers in the Australia, Canada, Japan and the US feared losing out, vis-a-vis other countries with lower or no binding emissions targets (Harrison & Sundstrom, 2007, p. 12). The Bush administration and the Senate (e.g., Byrd-Hagel resolution) opposed legal emissions targets for developed, but not developing, economies (Harrison, 2010, p. 95). Australia, Canada and Japan were especially concerned about their economic competitiveness vis-à-vis their main trading partner, after the US non-ratification (Crowley, 2007, p. 118; Harrison & Sundstrom, 2010b, p. 277; Tiberghien & Schreurs, 2010, pp. 140ff.). In contrast to other developed countries, Australia and the US negotiated relatively high emissions reduction targets, compared to the business-as-usual development of their greenhouse gas emissions (see also Chapter 2). The EU burden-sharing agreement and below business-as-usual emissions targets enabled European countries to enter the Kyoto Protocol. Harrison and Sundstrom (2007, p. 12) have concluded that competition concerns affected Kyoto Protocol ratification in countries with high emissions reduction targets.

In accordance with the general globalisation literature (e.g., Garrett, 1998, p. 53), most statistical studies focus on the effect of trade and capital openness.[31] The use of economic-openness indicators to test the hypothesis that a country's (climate) policy depends on the policy of competitors or major trading partners can lead to ambiguous findings (Dobbin et al., 2007, p. 459). Simmons et al. (2006, pp. 793f.) have argued that '[t]here is no particular

[31] To test the California effect on Kyoto Protocol ratification, Dolšak (2013, p. 394) controlled for the effect of exports to Germany in his statistical analysis. He has not reported his results.

reason to believe that A's level of exposure to world markets per se is responsible for policy liberalization or deregulation, especially if few other countries with whom A competes have themselves done so.' The focus on economic openness clearly limits our knowledge of the relationship between economic globalisation and climate commitment and performance. As argued in Chapter 3.1.1, it is important to study both.

Neumayer (2002) provided the only statistical analysis to focus on economic globalisation and the ratification of international environmental and climate agreements. Several studies have controlled for economic openness in their multivariate models (e.g., Bättig & Bernauer 2009; Fredriksson & Gaston, 2000). Most studies of UNFCCC/Kyoto Protocol ratification have employed a survival analysis (see Chapter 2), pooling rich and poor countries. Neumayer (2002) reached no coherent result, based on multiple indicators of international economic embeddedness (economic openness and liberalisation). Fredriksson and Gaston (2000) also observed no significant effect of economic openness on the delay in ratifying the UNFCC. By contrast, Bättig and Bernauer (2009, p. 289) concluded that trade openness was associated with a lower climate commitment. The different measures of climate commitment (see Table 3.1 & Chapter 2) must be considered. The ambiguous results of quantitative research can be explained by the case-study finding that competition concerns derived from economic openness and interdependence mattered only for developed countries with high emissions reduction targets.

Table 3.1 Quantitative research on international economic integration and climate commitment

Study	Countries	Dependent variable	Measurement of economic globalisation	Effect
Fredriksson & Gaston, 2000	Pooled analysis of developed and developing countries	Ratification delay of the UNFCCC	Trade openness Sachs-Warner index (Sachs & Warner, 1995)	/
Neumayer, 2002	Pooled analysis of developed and developing countries	Ratification of the KP	Multiple indicators, Fraser institute index	/ +
Bättig & Bernauer, 2009	Pooled analysis of developed and developing countries	Climate policy output compoment from Bättig et al. (2008)	Trade openness	-
Dolšak, 2013	26 Eastern European countries	Ratification of the KP	Exports to Germany (California Effect)	Not reported

Notes: + positive effect, / no effect, - negative effect on climate commitment. KP = Kyoto Protocol.

Most quantitative studies of international economic integration and climate performance have examined CO_2 emissions per capita levels, or changes (see Table 3.2 & Chapter 2). The present research employs cross-sectional or pooled time-series regression analysis. In contrast to the theoretical discussion, most studies have pooled developed and developing countries. The results on the effect of economic openness are ambiguous. Bättig and Bernauer (2009), Jahn (2008), Frankel and Rose (2005), Li and Reuveny (2006), and Ward et al. (2014) all found that trade openness was not statistically significantly associated with CO_2 emissions per capita. In time-series cross-section analyses of developing countries from 1970 to 2000, Spilker (2013; 2012; Ruoff, 2009) showed that trade openness increased CO_2 per capita emissions in developing countries (see also Biswas et al., 2012), while capital openness had no effect. Bättig and Bernauer (2009) observed a significant negative effect of trade openness, only when they used the climate policy outcome measure proposed by Bättig et al. (2008).

Table 3.2 Quantitative research on international economic integration and climate performance

Study	Countries	Dependent variable	Economic globalisation	Effect
Frankel & Rose, 2005	Pooled analysis of developed and developing countries	Industrial CO_2 emissions per capita	Trade openness	/
Li & Reuveny, 2006	Pooled analysis of developed and developing countries	CO_2 emissions per capita	Trade openness	/
Jahn, 2008	Developed countries	Annual change in CO_2 emissions in total/ traffic/ industry	Trade openness, Policy diffusion	/ - on CO_2 emissions in industry
Bättig & Bernauer, 2009	Pooled analysis of developed and developing countries	Climate policy outcome measure (Bättig et al., 2008), CO_2 emissions per capita	Trade openness	- on climate policy outcome, / on CO_2 emissions per capita levels and changes
Ruoff, 2009	Developing countries	CO_2 emissions per capita	Trade openness Capital openness	/ /
Biswas et al., 2012	Pooled analysis of developed and developing countries	CO_2 emissions per capita	Trade openness	/
Spilker, 2012	Developing countries	CO_2 emissions per caita	Trade openness Capital openness	- /
Spilker, 2013	Developing countries	CO_2 emissions per caita	Trade openness Capital openness	- /
Ward et al., 2014	Autocracies	CO_2 emissions per capita	Trade openness	/
Chang, 2015	Pooled analysis of developed and developing countries	CO_2 emissions per capita	Trade openness	-

Notes: + positive effect, / no effect, - negative effect on climate performance.

In sum, research suggests that trade openness undermines climate performance in developing countries only, if at all. This finding is in line with my discussion of the theoretical literature. There is support for the argument that economic interdependence affects climate performance. The results from Jahn (2008) confirm that policy diffusion affects changes in traffic CO_2 emissions in developed countries. Based on case-study research, Henry and Sundstrom (2010, p. 118) have argued that the slow implementation of Kyoto Protocol in Russia reflected concerns about economic competitiveness and economic growth.

Most explanatory models of empirical studies implicitly assume additive effects of economic openness and/or interdependence on climate commitment and performance. There has been no quantitative research on the impact of interaction effects between domestic politics and international economic integration on climate commitment and little research on their impact on climate performance.[32] One exception is Spilker (2013), who found that regime type, measured using data from Freedom House and Polity IV, weakened the negative effect of trade openness on local air but not on global air pollution (CO_2 emissions). Chang (2015) showed that trade openness contributed to CO_2 emissions in corrupt countries but decreased pollution in countries with low levels of corruption.

To summarise, case studies suggest that economic interdependence had an impact on the Kyoto Protocol ratification of some countries. Few quantitative studies have examined the effect of policy diffusion via competition on

[32] On general empirical globalisation and policy-diffusion research, see, for example, Jahn and Stephan (2015, p. 33)

climate commitment and performance. Instead, quantitative research has focused on the effect of economic openness – in particular, trade openness – on climate commitment and performance. The results regarding the ratification of international climate agreements are ambiguous. This review suggests that economic openness, measured by trade openness, undermines climate performance in developing countries. Economic interdependence has an important impact on climate change mitigation in developed countries. There has been little research on the latter topic outside the developed world. There has also been scant quantitative research on whether the effect of international economic integration is moderated by domestic political institutions.

3.1.4 Conclusions

Does economic globalisation contribute to or undermine climate commitment and performance? Does its effect depend on domestic political institutions? Based on a literature review, this chapter formulates hypotheses on the relationship between international economic integration and climate commitment and performance (see also Table 3.3). It presents the conclusions of the literature review on the interrelationship between economic globalisation and domestic political institutions. As various theoretical arguments link economic openness and interdependence to climate commitment and performance, hypotheses are formulated for both understandings of international economic integration. In accordance with Chapter 2, differences in UNFCCC and Kyoto Protocol ratification and between developed and developing countries are considered. In accordance with the empirical analysis (see Chapter 7), Table 3.3 formulates hypotheses on climate commitment referring to the pooled and developing-country samples.

Climate commitment

There is no clear effect of economic openness and interdependence on UNFCCC and Kyoto Protocol ratification in developed countries. As the UNFCCC has no binding emissions targets, competition concerns are less important. When business-as-usual development is taken in to account, the greenhouse gas emissions targets of the Kyoto Protocol were ambitious for some countries only (see Chapter 2). According to neoliberal institutionalist theory, international economic integration also has positive effects on climate-treaty ratification in the developed world. Previous findings are ambiguous. There has been a lack of quantitative research on policy diffusion and climate commitment.

According to the theoretical arguments, trade and capital openness can undermine climate commitment in developing countries via the composition effects of economic growth (pollution-haven hypothesis). However, empirical research has produced ambiguous results. Moreover, Chapter 2 argues that international economic integration is unlikely to affect climate commitment. For this reason, no effects of economic openness on UNFCCC or Kyoto Protocol ratification are expected in developing countries. Economic interdependence is unlikely to affect climate commitment in poor countries, as they are not obliged to reduce their greenhouse gas emissions.

Climate performance

Based on the theoretical discussion and previous results, economic openness is likely to undermine climate performance in developing countries. While the technique effects are ambiguous, the theoretical discussion suggests that economic growth has negative scale and composition effects. Previous empirical research has supported a negative effect of trade openness on climate performance in developing countries. No clear effects of trade and capital openness in developed countries are expected. On the one hand, there may be competition pressure and negative scale effects of trade openness. On the other hand, positive composition effects (shifting pollution and labour-intensive production to developing countries) are also possible. In the developed world, a country's climate performance depends on the policies of its main trading partners or competitors. There is likely to be no effect of policy diffusion on climate performance in developing countries, which are allowed to focus on economic development. Little empirical research has examined the effect of policy diffusion on climate performance in poor countries.

Table 3.3 International economic integration and climate commitment and performance

	UNFCCC		Kyoto Protocol		Climate Performance	
	Pooled analysis *Developing countries*		Pooled analysis *Developing countries*		Developed countries *Developing countries*	
Trade openness	$H_{Int}1.1.1$	/	$H_{Int}1.2.1$	/	$H_{Int}1.3.1$	/
	$H_{Int}1.1.2$	*/*	*$H_{Int}1.2.2$*	*/*	*$H_{Int}1.3.2$*	-
Capital openness	$H_{Int}2.1.1$	/	$H_{Int}2.2.1$	/	$H_{Int}2.3.1$	/
	$H_{Int}2.1.2$	*/*	*$H_{Int}2.2.2$*	*/*	*$H_{Int}2.3.2$*	-
Economic interdependence	$H_{Int}3.1.1$	/	$H_{Int}3.2.1$	/	$H_{Int}3.3.1$	+/-
	$H_{Int}3.1.2$	*/*	*$H_{Int}3.2.2$*	*/*	*$H_{Int}3.3.2$*	/

Notes: + positive effect, / no effect, - negative effect on climate commitment/ performance, +/- direction unclear.

Race-to-the-bottom theory argues that economic globalisation affects climate commitment and performance via competition pressures, independent of domestic political institutions. However, the literature review has found multiple effects of economic openness and interdependence on climate commitment and performance. The previous section has also shown that there are many possible moderation effects of domestic political institutions on the influence of economic globalisation and climate commitment and performance. While governments may react in similar ways to competition pressures caused by economic openness and interdependence, domestic political institutions can still impact the implementation of climate policies and/or have indirect effects on international trade and investment and, via economic growth, on climate performance. Few theoretical or empirical studies have investigated the interaction effects between globalisation and domestic political institutions on climate commitment and performance. With few exceptions, quantitative explanatory models of climate commitment and performance have assumed additive effects of international economic integration. Existent studies (Chang, 2015; Spilker, 2013) have not compared multiple domestic political institutional factors and globalisation dimensions. This study intends to fill this research gap.

3.2 International political integration and climate commitment and performance

This chapter examines the existing theoretical and empirical literature on political globalisation and climate commitment and performance (3.2.2 & 3.2.3). Is international political integration good or bad for climate commitment and performance? How does it affect state participation in climate cooperation? Is its effect moderated by domestic political institutions? To answer these questions, I begin by discussing the conceptualisation of international political integration (3.2.1). The conclusion formulates hypotheses about the relationship between international political integration and climate commitment and performance (3.2.4). The literature review suggests that political globalisation, understood as state involvement in IGOs, is likely to contribute to climate commitment and performance through exposure to international norms, values, scientific knowledge, and pressures caused by IENGOs and foreign governments, as well as increased reputation costs. Neoliberal institutionalist foreign policy, constructivist foreign-policy theory, and world society theory suggest that this relationship is moderated by domestic political institutions. Little quantitative research has been carried out on this topic. Based on the hypotheses in this chapter and the discussion of the literature on domestic political institutions and institutional quality in Chapter 4, Chapter 5 contributes to the literature by formulating additional hypotheses on the joint effect of domestic political institutions and international political integration.

3.2.1 Conceptualisation of international political integration

In the globalisation/environment literature, two conceptualisations of international political integration can be distinguished: international political embeddedness and a country's centrality in international political networks. Scholars who address the relationship between political globalisation and the environment, within neoliberal institutionalist theory, define international political integration, in accordance with the international embeddedness concept, as state involvement in IGOs (e.g., Bernauer et al., 2013; Bernauer et al., 2010, p. 514; Spilker, 2013, p. 14; Spilker, 2012, pp. 347f.). Constructivist approaches, including world society theory, adopt a broader understanding of international political embeddedness. For instance, world-society theorists consider 'linkages to world society' (Frank, 1999, p. 527) via a country's participation in IGOs and international NGOs (INGOs) (Frank, 1999, pp. 526f.; Frank et al., 2000, pp. 97f., 103).

Ward (2006) introduces a social-network perspective to the literature on political globalisation and the environment. He assumes that states are linked to other states through their common membership of IGOs, INGOs and international agreements (Ward, 2006, p. 150). In contrast to the international political embeddedness concept, states are not simply members of environmental regimes, they also belong to the network of environmental regimes (Ward, 2006, p. 150). Network centrality is defined as the number of links to other countries and the number of treaties that country i and j are members of (Ward, 2006, p. 152). Network centrality indicates a country's social capital (Dorussen & Ward, 2008, pp. 190, 196).

To conclude, international political integration, in the academic literature on climate commitment and performance, is either aligned with the international political embeddedness concept or with the social network concept. Conceptualisations of international political integration focus either on state involvement in IGOs or consider international treaties and INGOs. I will test both in the statistical analysis. For reasons of data availability, the analysis will focus on state involvement in IGOs and state centrality in IGO networks (see Chapter 6).

3.2.2 Review of the main theoretical approaches

This section discusses the theoretical literature on political globalisation and climate commitment and performance. Three theoretical perspectives can be distinguished in the literature on political globalisation and the environment: neoliberal institutionalist foreign-policy theory (3.2.2.1), constructivist and world society theory (3.2.2.2), and social network theory (3.2.2.3). Each theoretical perspective is discussed in relation to the following questions: Is international political integration good or bad for climate commitment and performance? How does it affect state participation in climate cooperation, and does its effect depend on domestic political institutions? While these perspectives have also been applied to climate performance, they predominately refer to cooperative foreign policy (e.g., climate commitment) as the dependent variable.

3.2.2.1 Neoliberal institutionalist foreign-policy theory

Neoliberal foreign-policy theory assumes, in addition to interdependence (see Chapter 3.1.2.3), state participation in international institutions contributes to cooperative state behaviour (Beach, 2012, p. 56). International institutions refer to 'sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations' (Krasner, 1983, p. 2). While interdependence makes states more willing to cooperate, anarchy implies that other states may cheat (Beach, 2012, p. 53). Involvement in international institutions, such as IGOs, enables countries to follow cooperative foreign policy under conditions of anarchy (Beach, 2012, p. 53; Harnisch, 2013, pp. 419f.). Thus, scholars expect countries that are more involved in IGOs to be more committed to climate cooperation and to perform better in climate change mitigation (e.g., Bernauer et al., 2010; Spilker, 2013; 2012; Roberts et al., 2004; Ruoff, 2009). IGOs facilitate environmental cooperation by reducing transaction costs, uncertainty, and opportunism, while enabling efficient problem-solving and bargaining (Bernauer et al., 2010, p. 515f.; Spilker, 2012, p. 348). By providing a negotiation framework, they enable states to communicate, find common interests, and discover issue linkages (Beach, 2012, p. 55; Harnisch, 2013; Spilker, 2012, p. 346). Furthermore, IGOs raise reputational costs, encouraging countries to participate in climate agreements and to act in accordance with them (Kneuer, 2012, p. 873; 348; Ruoff, 2009, p. 7; Spilker, 2012, pp. 346). Environmental IGOs contribute to climate performance through compliance measures, such as monitoring and sanction mechanisms (Bernauer et al., 2010; Ruoff, 2009, p. 7; Spilker, 2012, p. 348). Bernauer et al. (2010, p. 516) and Spilker (2012, p. 356; Ruoff, 2009, pp. 13f.) regard the number of state memberships in IGOs as decisive. Involvement in multiple IGOs supports issue linkages and raises reputation costs.

While the standard explanatory model of neoliberal institutionalist theory assumes that international explanatory factors influence foreign policy, independent of domestic politics, neoliberal institutionalist foreign-policy theory acknowledges the importance of domestic politics in environmental policy (see Chapter 3.1). For instance, Keohane (1996, pp. 24ff.; see also Carbonell & Allison, 2015, p. 83) argues in a study of environmental IGOs and state participation in environmental cooperation that future research should consider domestic political institutions. With the exception of compliance measures, involvement in IGOs can only be understood as an incentive, encouraging governments to join international climate agreements and to adopt and enact climate policies. As the ratification of international agreements, as well as climate change mitigation policies, depend on the domestic decision-making process, it is plausible to assume that domestic political institutions do influence IGOs. Few studies have investigated the joint influence of domestic political institutions and IGOs on climate commitment and performance. Ruoff (2009, p. 3) has argued that the effect of membership in IGOs on environmental quality is enhanced by democracy. Democracies are more likely to join IGOs and are more responsive to the influence of IGOs (Ruoff, 2009, pp. 9ff.).

In sum, international political integration, defined as state involvement in IGOs, is likely to contribute to a cooperative climate policy by making cooperation between states easier and raising reputational costs. Neoliberal

institutionalist theorists acknowledge that domestic political factors have an influence on international political integration.

3.2.2.2 Constructivist foreign-policy theory and world society theory

Constructivist theory assumes that foreign policy is influenced by domestic and global norms and ideas (Barkdull & Harris, 2002, p. 74; Brummer & Oppermann 2014, pp. 56f., 59). Norms are defined as standard[s] of appropriate behaviour for actors with a given identity' (Finnemore & Sikkink 1998, p. 891). Within this perspective, policy decision-makers are central actors (Brummer & Oppermann, 2014, p. 59). They internalise norms through transnational and societal socialisation processes (Brummer & Oppermann, 2014, p. 59). International political integration is seen as a socialisation mechanism (Brummer & Oppermann, 2014, pp. 61ff.; Young & Levy 1999, p. 23f.). IGOs are regarded as norm entrepreneurs (Hafner-Burton et al. 2008, p. 178; Young & Levy 1999, p. 23f.). Thus, global environmental norms influence a country's climate policy through international political integration (Ruoff, 2009, p. 8; Spilker, 2012, p. 348; Yamagata et al., 2013, p. 252). Yamagata et al. (2013, p. 256) regard IGOs, NGOs, and a country´s experience with international environmental agreements as decisive. In addition, the number of memberships in IGOs and INGOs is emphasised (Roberts, et al., 2004, p. 25). World society theory offers a similar argument: that global norms and ideas affect climate commitment. World models define 'what the nation-state is, what it can do, and how it can relate to other entities are organised and established globally' (Frank et al., 2000, p. 100). They can be informal or formal (e.g., international agreements or IGOs) (Frank, 1999, p. 528). The more countries are linked to the world society, the more they are exposed to world models and expected to act in accordance with them, i.e to participate in environmental cooperation and protect the environment (Frank, 1999, pp. 527f., 529f.; Frank et al., 2000, p. 102). Meyer et al. (1997, pp. 626, 629ff.) argue that a common rational and scientific interpretation of the environment, at the international level, alongside the international environmental debate at the United Nations, contributed to environmental protection. Constructivist and world society theory assume that countries integrated into international societies are more likely to ratify international climate treaties to gain legitimacy and reputation at the international level (Hafner-Burton & Tsutsui, 2005, p. 1382; Roberts et al., 2004, p. 25). Finally, IGOs also provide forums in which environmentally friendly governments and non-state actors can influence countries (Ruoff, 2009, p. 8; Spilker, 2012, p. 348).

Both theoretical perspectives suggest an independent effect of global norms on state behaviour (Barkdull & Harris, 2002, p. 73; Frank, 1999, p. 528; Frank et al., 2000, p. 99). Nonetheless, several constructivist and world-society theorists have argued that domestic norms and structures (including domestic political institutions) influence a country's responsiveness to (or the salience of) global norms (Checkel, 1999, p. 87ff.; Cortell & Davis, 2000, p. 79; Frank et al., 2000, p. 103). Risse-Kappen (1994, p. 187) argues that epistemic communities only affect foreign policy if domestic factors, such as institutions, groups and norms, support this influence. Domestic political institutions 'establish rights and obligations, identify what is legitimate and what is not, and, in the process, help national actors define their interests domestically and internationally' (Cortell & Davis, 2000, p. 79). Thus, domestic and international norms can enhance or weaken each other (Boekle et al., 2001, p. 80; Brummer & Oppermann, 2014, p. 59). Structures and norms already established in countries moderate the effect of international norms, allowing governments to respond in different ways to international political integration (Finnemore & Sikkink, 1998, p. 893). Societal groups and transnational actors can influence foreign policy (Brummer & Oppermann, 2014, p. 64) or use international norms to pressure foreign policy decision-makers (Finnemore & Sikkink, 1998, p. 893).

In sum, constructivist and world society theory assume that international political integration contributes to climate commitment and performance. Countries embedded in the international political system internalise international environmental environment norms, values, and scientific understandings. Moreover, they are pressured by foreign governments and international ENGOs to consider climate cooperation. Finally, participation in climate cooperation increases their international reputations. Constructivist and world-society theorists argue that domestic political institutions influence a country's responsiveness to international political integration and, therefore, strengthen or weaken international incentives.

3.2.2.3 Social Network Theory

Following Ward (2006), scholars have examined the relationship between international political integration and climate and environmental policy from the perspective of social network theory (e.g., von Stein, 2008). Ward (2006, p. 150) agrees with neoliberal institutionalism that a country's embeddedness in international political institutions makes cooperation more likely among states. He regards the centrality of states in networks of international institutions as crucial for each country's environmental policy (Ward, 2006, p. 150). Second, state preferences are regarded as endogenous and influenced by their centrality in international networks.

Ward (2006, p. 151) refers to social network theory and democracy peace theory to explain the importance of international networks to state preferences. States are linked into networks via their common membership in IGOs

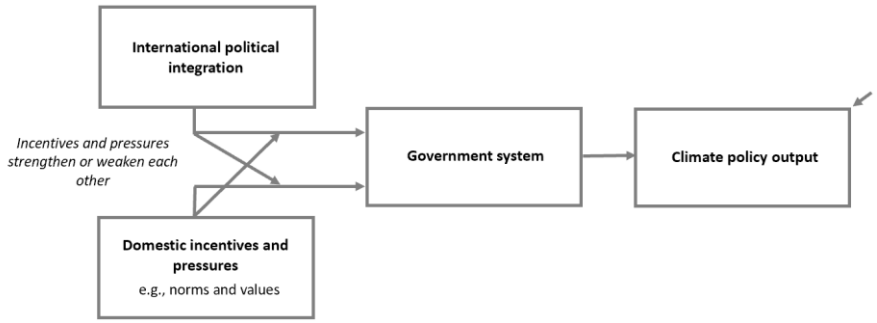
and international treaties (Ward, 2006, p. 151f.). Following social network theory and democracy peace theory, Ward (2006, pp. 150f., 154, 162) argues that state centrality in international networks contributes, via social capital, to a more cooperative foreign policy, sustainable state behaviour, and effective international cooperation (see also von Stein, 2008, p. 252). Network links make reciprocal behaviour possible, offer more opportunities for sanctioning bad behaviour (e.g., via issue linkage), increase information transfer and the spread of norms, and increase trust among countries (Ward, 2006, pp. 150ff.). Multiple network links imply that a country can be more easily encouraged by other countries to consider environmental protection (Ward, 2006, pp. 152, 154). Such countries should, therefore, give more thought to the responses of other states toward their environmental policies. Jänicke (2005, p. 132) has argued that IGOs and networks of IGOs increase the diffusion of environmental policies among innovative countries.

To conclude, the social network perspective suggests that a country's centrality in international IGO and INGO networks contributes to a more cooperative climate policy through norms, social trust and reputation, the diffusion of environmental of environmental policies, and pressures applied by foreign governments. Scholars have not addressed their interrelationship with domestic explanatory factors within this perspective.

3.2.2.4 Conclusions

Is political globalisation good or bad for climate commitment and performance? How does it affect state participation in climate cooperation? The theoretical literature agrees that international political integration, understood as state membership in IGOs and INGOs or as state centrality in international networks, contributes to climate commitment and performance through the exposure to international norms, values, and scientific knowledge, as well as through pressures caused by IENGOs and foreign governments and increased reputation costs. IGO involvement affects climate commitment and performance because it exposes governments to international incentives to take part in climate cooperation. International political integration matters more to climate commitment than to performance. First, it is harder to monitor the ratification of international agreements than their implementation. Second, other factors (e.g., competition pressures) have more influence on climate performance. While neoliberal institutionalist and constructivist foreign-policy theory explains foreign policy, this book applies its assumptions to climate performance, arguing that climate policies influence climate performance.

Figure 3.5 The joint effect of domestic political institutions and international political integration



Does the effect of international political integration depend on domestic political institutions? The theoretical traditions regard state involvement in IGOs either as an incentive, encouraging governments to participate in international climate cooperation, or as constitutive of government preferences. Thus, international and domestic incentives that target government behaviour can strengthen or weaken each other. Constructivist and world society perspectives acknowledge that domestic (political) factors are important to the effect of international political integration. Domestic political institutions affect the responsiveness of governments to incentives derived from international political integration (see Figure 3.5). Few theoretical studies have examined climate commitment and performance in this regard. Ruoff (2009) argues that democratic governments, which are generally more open to international cooperation, should also perform better when it comes to environmental and climate protection.

3.2.3 Empirical research

Previous empirical research on political globalisation and climate commitment and performance includes both case studies and statistical analyses. Most quantitative studies measure international political integration, either by state involvement in IGOs or INGOs or by state centrality in IGO networks. Given the available data, there is little research on multiple operationalisations. In accordance with the theoretical perspectives, previous work has focused on climate commitment.

Case studies support the view that political globalisation contributes to Kyoto Protocol ratification. They show that international norms play a role. Harrison and Sundstrom (2007, p. 11) argue that the norms of the Canadian

president were decisive for the ratification of the Kyoto Protocol. Harris (2000, pp. 48f.) argues that the turn towards climate cooperation under the Clinton administration, in comparison to the previous Bush administration, resulted partly from the acceptance of norms of fair and equitable burden sharing. Yet, Harrison (2010, p. 95) maintains that economic globalisation was more important to the non-ratification of the Kyoto Protocol. Second, the case studies show that international reputation was important. The Russian president, Putin, entered the Kyoto Protocol to secure Russia's alliance with the EU and to gain European support for Russia's World Trade Organisation (WTO) membership (Harrison 2010, p. 116; Harrison & Sundstrom, 2010b, p. 275f.; Harrison & Sundstrom, 2007, p. 11; Henry & Sundstrom, 2010, p. 114).[33]

Survival analyses offer mixed results on the relationship between political globalisation and the ratification of climate treaties. Von Stein (2008) finds that the centrality of states in the IGO network accelerated UNFCCC ratification among Annex I countries. She finds no clear effect of network centrality on Kyoto Protocol ratification in Annex I and Non-Annex I countries. Yamagata et al. (2013) observe no significant effect of the number of IGOs and membership in the International Council for Science on UNFCCC and Kyoto Protocol ratification. They observe that the number of important international ENGO offices in a country contributes to UNFCCC ratification. There has been a lack of quantitative research on the joint influence of political globalisation and domestic politics on climate commitment.

The results of research on international political integration and climate change mitigation are also ambiguous. Henry and Sundstrom (2010, p. 120) argue that Russia was slow to report to the UNFCCC, submitting only incomplete reports and data because membership had little effect on its international reputation. Spilker (2012, 2013) has found, through a multivariate time-series-cross-sectional analysis of CO_2 emissions in developing countries from 1970 to 2000, that membership in the IGO reduces global air pollution. In an earlier analysis of developing countries, she found that, while the effect of IGO membership on SO_2 emissions, a local air pollutant, was higher in democracies, there was no significant interaction effect on CO_2 emissions (Ruoff, 2009, p. 16).

In sum, there is support for the theoretical expectation that the positive effect of political globalisation matters more to climate commitment than to performance. Second, the results indicate that the importance of international political integration varies between the UNFCCC and the Kyoto Protocol, as well as among Annex I and Non-Annex I parties. Explanatory models of quantitative studies assume additive effects of political globalisation on climate commitment and performance.

3.2.4 Conclusions

International political integration is understood either as state memberships in IGOs and the presence of INGOs in countries, or as centrality in IGO and/or INGO networks. The lack of available data (see Chapter 6) limits this empirical analysis to state memberships in IGOs and centrality in IGO networks. Based on a discussion of the theoretical and empirical literature, this section proposes hypotheses on the relationship between international political integration and climate commitment and performance (see Table 3.4). It also summarises the conclusions of the theoretical and empirical literature on the possible moderation effects of domestic political institutions.

The theoretical and empirical literature suggests that IGO involvement has a positive effect on climate commitment and performance (see Table 3.4) because it exposes governments to international incentives – international norms, values, and scientific knowledge, pressures caused by IENGOs and foreign governments, and increased reputation costs – to join climate cooperation. The effect of international political integration is more important for climate commitment (ratification of the UNFCCC and Kyoto Protocol) than for climate performance. First, ratifying climate treaties costs very little, in contrast to climate change mitigation. Second, other factors may be more important to implementing climate-protection policies. In accordance with the conclusions drawn in Chapter 2, political globalisation has a more positive effect on UNFCCC than on Kyoto Protocol ratification. It is easier for governments to ratify the UNFCCC than the Kyoto Protocol, due to international incentives. First, for developed countries, the Kyoto Protocol encompasses binding emissions reduction targets. Second, the Kyoto Protocol includes domestic implementations for developing countries. For instance, the clean-development mechanisms include support, provided by industrialised countries, of sustainable development and environmental protection in poor countries.

[33] Since its ratification was needed for the Kyoto Protocol to enter into force, it was able to put pressure on European governments (Henry & Sundstrom, 2010, p. 106). Russia's commitment under the Kyoto Protocol implied that it could considerably increase CO_2 emissions and still meet its greenhouse gas target (Henry & Sundstrom, 2010, p. 108).

Table 3.4 International political integration and climate commitment and performance

	UNFCCC		Kyoto Protocol		Climate Performance	
	Developed & developing countries		Developed & developing countries		Developed & developing countries	
Political globalisation	$H_{Int}4.1$	+	$H_{Int}4.2$	+	$H_{Int}4.3$	+

Notes: + positive effect, / no effect, - negative effect on climate commitment/ performance, +/- direction unclear.

Based on the theoretical literature, domestic political institutions moderate the effect of international political integration. Constructivist and world society perspectives assume that domestic incentives affect the responsiveness of governments to incentives derived from international political integration. Thus, international and domestic explanatory factors can strengthen or weaken each other. There has been little theoretical or empirical research on this topic. Previous research has focused on whether the effect of political globalisation on climate performance varies among democracies and autocracies. Based on the analysis of the literature on relevant domestic political institutional factors of climate commitment and performance discussed in Chapter 4, Chapter 5 will discuss possible moderation effects.

3.3 Conclusions

To examine whether domestic political institutions moderate the effect of globalisation on climate commitment and performance, this chapter began by analysing the relationship between globalisation and climate commitment and performance in the previous literature. The literature review shows that both economic and political globalisation have multiple effects on climate commitment and performance. With regard to economic globalisation, it is also important to distinguish between economic openness and interdependence. Economic openness influences state participation in climate cooperation through exposure to competition and reputational pressures, as well as the scale, composition, and technique effects of economic growth. Economic interdependence makes countries consider the climate commitment and performance of important trading partners and economic competitors. In this context, political globalisation is understood to be state involvement in IGOs. International political integration influences climate commitment and performance via exposure to international norms, values, and scientific understandings, as well as to the influence of IENGOs and foreign governments and increased reputation costs. Chapters 3.1 and 3.2 formulated hypotheses on the effects of international economic and political integration on climate commitment and performance. Based on the literature, this study assumes that economic openness undermines Kyoto Protocol ratification and performance in developing countries, via scale and composition effects. In the developed world, international economic integration influences climate commitment and performance through policy diffusion. International political integration contributes to climate commitment because it increases exposure to incentives to join climate cooperation. Chapter 5 will add hypotheses on the joint relationship between international integration and domestic political institutions, in relation to climate commitment and performance.

Second, this chapter has examined the existing literature to determine whether domestic political institutions moderate the effects of economic and political globalisation. Race-to-the-bottom theory and neoliberal institutionalist theory assume that globalisation affects climate commitment and performance, independent of domestic political institutions. However, as explained above, both economic and political globalisation have multiple effects on climate commitment and performance. Moreover, the theoretical discussion has shown that most underlying theoretical approaches, which link economic and political globalisation to climate commitment and performance, assume that domestic political institutions moderate the effect of international integration. Four possible moderation effects have been identified. First, international economic and political integration are regarded as incentives or pressures on governments to behave in a certain way (e.g., globalisation, policy convergence, and diffusion theory). Thus, state responses to international integration depend on the domestic decision-making process. Second, domestic political factors involved in the implementation of climate policies influence the relationship between international integration and climate performance. Third, domestic political institutions affect a country's exposure to international incentives and pressures and should, therefore, strengthen or weaken incentives and pressures related to international integration. Finally, domestic political institutions and institutional quality influence the effect of international economic embeddedness as context factors, on climate performance via economic growth. Thus, while government institutions make little difference to state responses to competition pressures caused by economic globalisation, domestic political institutions moderate the effects of economic globalisation because they affect the implementation of climate policies. Moreover, there are multiple effects of economic globalisation (competition pressures, reputation costs associated with joining international cooperation, and scale, composition, and technique effects) and political globalisation (exposure to international norms and values, pressures caused by international ENGOs and foreign governments, and reputation costs). Thus, while domestic political institutions

make little difference to state responses to competition pressures, they moderate other effects of economic and political globalisation.

There has been little theoretical or empirical work on the joint influence of domestic politics and globalisation on the ratification and implementation of climate treaties. The policy-diffusion literature simply offers categories of possible domestic (political) moderator variables. There is no agreement on what domestic (political) factors have a decisive impact on international integration. However, three different strands can be distinguished in the broader literature on the joint influence of domestic political institutions and globalisation on public policy. They have also been applied to environmental commitment and performance. First, scholars have examined state responses on globalisation from the perspective of veto player theory (e.g., Cao & Prakash, 2012; Ha, 2012, 2008; Wenzelburger & Zohlnhöfer, 2015; Zohlnhöfer, 2005). The underlying assumption is that political authorities must agree to policy changes. The smaller the number of veto players involved and the lower the ideological distance among them, the greater the effect of international pressures and incentives derived from globalisation on public policy (Ha, 2008, pp. 791f.). The underlying assumption that is that a small number of veto players with little ideological heterogeneity enables governments to react fast to international pressures (Ha, 2008, pp. 791f.). Different effects on environmental policy outputs and outcomes are expected (e.g., Cao & Prakash, 2012). This literature also considers possible interaction effects among the partisan composition of governments and globalisation (e.g., Ha, 2012; Zohlnhöfer, 2005). Cao and Prakash (2012) have used this explanatory model to explain domestic pollution. To date, it has never been applied to climate commitment and performance.

Second, as explained in Chapter 3.1, economists argue that the effect of economic globalisation on environmental protection depends on institutional quality (e.g., Chang, 2015; Damania et al., 2003). This research examines environmental quality or pollution as the dependent variable. With regard to institutional quality, the focus is on political corruption. Political corruption strengthens the negative effects of international economic integration on climate performance. Corrupt governments are more likely to reduce environmental regulations or fail to implement environmental regulations, reflecting the interests of industry lobbies (Chang, 2015, pp. 235f.). When there is government corruption, bribery becomes more important than social welfare (Damania et al., 2003, p. 492).

Third, comparative environmental and social policy research has examined differences in state responses to globalisation on (environmental) policy outputs and outcomes between democracies and autocracies. This perspective combines the literature on globalisation and public policy and regime type and public policy; it ‘considers joint effects of regime type and globalization’ (Rudra & Haggard, 2005, p. 1016). Rudra and Haggard (2005, p. 1016) summarise the main research question in this literature: ‘How do regimes of different types respond to globalization?’ While the globalisation-social policy literature assumes that international pressures lead to lower social-welfare commitments, independent of domestic politics, the regime-type/public-policy literature assumes that democracies perform better than autocracies, when it comes to social policy (Rudra & Haggard, 2005, p. 1016). This literature therefore assumes that democracy lessens the negative effects and strengthens the positive effects of globalisation on social (e.g., Rudra & Haggard, 2005) and environmental policy (e.g., Spilker, 2012). As Chapter 3.1 explained, Spilker (2013, p. 59) offers an additional argument: that the rule of law allows firms to invest in environmentally friendly technology; this suggests that regime type, as a context factor influencing the behaviour of firms and investors, affects the relationship effect of trade openness on environmental performance via economic growth.

This study contributes to the literature initially by testing these explanatory models of climate commitment and performance. Few studies have investigated multiple explanatory models of the joint influence of domestic institutional factors and globalisation on climate commitment and performance (e.g., Ruoff, 2009; Spilker, 2013). Second, in contrast to previous research, this study considers multiple globalisation dimensions: economic openness, economic interdependence and international political integration. This chapter has shown that aspects of globalisation vary in their effect.

References

Aigne Roy, Eleanor. 2018. New Zealand bans all new offshore oil exploration as part of 'carbon-neutral future'. *The Guardian*. https://www.theguardian.com/world/2018/apr/12/new-zealand-bans-all-new-offshore-oil-exploration-as-part-of-carbon-neutral-future. Accessed 10 Feb 2019.

Andonova, Liliana, Edward D. Mansfield, Edward D., and Helen V. Milner. 2007. International trade and environmental policy in the postcommunist world. *Comparative Political Studies* 40(7):782–807.

Antweiler, Werner, Briand R. Copeland, and M. Scott Taylor. 2001. Is free trade good for the environment? *American Economic Review* 91(4):877–908.

Babones, Salvatore J. 2007. Studying globalization: Methodological issues. In *The Blackwell companion to globalization*, ed. George Ritzer, 144–161. Malden et al.: Blackwell Publishing.

Babones, Salvatore J. 2014. Methods for quantitative macro-comparative research. Los Angeles et al.: Sage.

Baek, Jungho, Yongsung Cho, and Won W. Koo. 2009. The environmental consequences of globalization: A country-specific time-series analysis. *Ecological Economics* 68(8-9):2255–2264.

Bättig, Michèle B., and Thomas Bernauer. 2009. National institutions and global public goods: Are democracies more cooperative in climate change policy? *International Organization* 63(2):281-308.

Bättig, Michèle B., Simone Brander, and Dieter M. Imboden. 2008. Measuring countries' cooperation within the international climate change regime. *Environment Science & Policy* 11:478–489.

Barkdull, John, and Paul G. Harris. 2002. Environmental change and foreign policy: A survey of theory. *Global Environmental Politics* 2(2):63–91.

Beach, Derek. 2012. Analyzing foreign policy. Houndmills et al.: Palgrave Macmillan.

Becker, Marin, Stefanie John, and Stefan A. Schirm. 2007. Globalisierung und Global Governance. Paderborn: Wilhelm Fink.

Bernauer, Thomas, and Ladina Caduff. 2004. In whose interest? Pressure group politics, Economic competition and environmental regulation. *Journal of Public Policy* 24(1):99–126.

Bernauer, Thomas, Anna Kalbhenn, Vally Koubi, and Gabriele Spilker. 2010. A comparison of international and domestic sources of global governance dynamics. *British Journal of Political Science* 40(3):509–538.

Bernauer, Thomas, Anna Kalbhenn, Vally Koubi, and Gabriele Spilker. 2013. Is there a "depth versus participation" dilemma in international cooperation? *The Review of International Organizations* 8(4):477–497.

Biswas, Amit K., Mohammad Reza Farzanegan, and Marcel Thum. 2012. Pollution, shadow economy and corruption: Theory and evidence. *Ecological Economics* 75:114–125.

Boekle, Henning, Volker Rittberger, and Wolfgang Wagner. 2001. Soziale Normen und normgerechte Außenpolitik. Konstruktivistische Außenpolitiktheorie und deutsche Außenpolitik nach der Vereinigung. *Zeitschrift für Politikwissenschaft* 11(1):71–103.

Börzel, Tanja, and Thomas Risse. 2009. The transformative power of Europe: the European Union and the diffusion of ideas. Berlin: Freie Universität Berlin. FB Politik- und Sozialwissenschaften. Otto-Suhr-Institut für Politikwissenschaft. (KFG Working Paper Series 1).

Boyce, James K. 2004. Green and brown? Globalization and the environment. *Oxford Review of Economic Policy* 20(1):105–128.

Braun, Dietmar, and Fabrizio Gilardi. 2006. Taking 'Galton's problem' seriously. Towards a theory of policy diffusion. *Journal of Theoretical Politics* 18(3):298–322.

Braun, Dietmar, Fabrizio, Gilardi, Katharina Füglister, and Stéphane Luyet. 2007. EX PLURIBUS UNUM: Integrating the different strands of policy diffusion theory. In *Transfer, Diffusion und Konvergenz von Politiken*. (Politische Vierteljahresschrift Sonderheft, 38), eds. Katharina Holzinger, Helge Jörgens, and Christoph Knill, 39–55. Wiesbaden: VS Verlag für Sozialwissenschaften.

Brummer, Klaus, and Kai Oppermann. 2014. Außenpolitikanalyse. Munich: Oldenbourg Verlag.

Busch, Andreas. 2007. The development of the debate: intellectual precursors and selected aspects. In *Globalization. State of the art and perspectives*, ed. Stefan A. Schirm, 22–39. London & New York: Routledge.

Busch, Per-Olof, and Helge Jörgens. 2005. The international sources of policy convergence: explaining the spread of environmental policy innovations. *Journal of European Public Policy* 12(5):860–884.

Cao, Xun, and Aseem Prakash. 2010. Trade competition and domestic pollution: A panel study, 1980-2003. *International Organization* 64: 481–503.

Cao, Xun, and Aseem Prakash. 2012. Trade competition and environmental regulations: Domestic political constraints and issue visibility. *The Journal of Politics* 74(1): 66–82.

Carbonell, Joel R., and Juliann E. Allison. 2015. Democracy and state environmental commitment to international environmental treaties. In *International Environmental Agreements: Politics, Law and Economics* 15(2):79–104.

Carporaso, James A., and Mary Anne Madeira. 2012. Globalization, institutions & governance. London et al.: Sage Publications.

Cerny, Philip G. 1995. Globalization and the changing logic of collective action. *International Organization* 49(4):595–625.

Chang, Shu-Chen. 2015. The effects of trade liberalization on environmental degradation. *Quality & Quantity* 49(1):235–253.

Chaudoin, Stephen, Helen V. Milner, and Xun Pang. 2015. International systems and domestic politics: Linking complex interactions with empirical models in international relations. *International Organization* 69(2):275–309.

Checkel, Jeffrey T. 1999. Norms, institutions, and national identity in contemporary Europe. *International Studies Quarterly* 43(1):84–114.

Clapp, Jennifer, and Peter Dauvergne. 2011. Paths to a green world. The political economy of the global environment. Second edition. Cambridge & London: The MIT Press.

Cole, Matthew A. 2004. Trade, the pollution haven hypothesis and the environmental Kuznets curve: examining the linkages. *Ecological Economics* 48(1):71–81.

Cole, Matthew A., Robert J.R. Elliott, and Liyun Zhang. 2017. Foreign direct investment and the environment. *Annual Review of Environment and Resources* 42(1):465–487.

Cole, Matthew A., and Per G. Fredriksson. 2009. Institutionalized pollution havens. *Ecological Economics* 68(4):1239–1256.

Conca, Ken. 2000. The WTO and the undermining of global environmental governance. *Review of International Political Economy* 7(3):484–494.

Copeland, Brian R., and Scott M. Taylor. 1994. North-south trade and the environment. *The Quarterly Journal of Economics* 109(3):755–787.

Copeland, Brian R., and Scott M. Taylor. 2004. Trade, growth, and the environment. *Journal of Economic Literature* 42(1):7–71.

Cortell, Andrew P., and James W. Davis Jr. 2000. Understanding the domestic impact of international norms: A research agenda. *International Studies Review* 2(1):65–87.

Crowley, Kate. 2007. Is Australia faking it? The Kyoto Protocol and the greenhouse policy challenge. *Global Environmental Politics* 7(4):118–139.

Damania, Richard, Perg G. Fredriksson, and John A. List. 2003. Trade liberalization, corruption, and environmental policy formation: theory and evidence. *Journal of Environmental Economics and Management* 46:490–512.

D'Anieri, Paul. 2012. International politics: Power and purpose in global affairs. Second Edition. International Edition. Wadsworth: Cengage Learning.

Dauvergne, Peter. 2017. The political economy of the global environment. In *Global political economy*. 5th edition, ed. John Revenhill, 387–414. Oxford: Oxford University Press.

Dean, Judith M. 2002. Does trade liberalization harm the environment? A new test. *Canadian Journal of Economics* 35 (4):819–842.

De Soysa, Indra, and Eric Neumayer. 2005. False prophet, or genuine savior? Assessing the effects of economic openness on sustainable development, 1980–99. *International Organization* 59(3), 731-772.

Dobbin, Frank, Beth A. Simmons, and Geoffrey Garrett. 2007. The global diffusion of public policies: Social construction, coercion, competition, or learning? *Annual Review of Sociology* 33(1):449–472.

Dolšak, Nives. 2013. Climate change policies in the transitional economies of Europe and Eurasia: The role of NGOs. *Voluntas* 24(2):382–402.

Dorussen, Han, and Hugh Ward. 2008. Intergovernmental organizations and the Kantian peace. *Journal of Conflict Resolution* 52(2):189–212.

Doyle, David. 2014. Partisanship, democracy and the global market economy. *Government and Opposition* 49(4):704–724.

Dreher, Axel, Noel Gaston, and Pim Martens. 2008. Measuring globalisation. Gauging its consequences. New York: Springer.

Drezner, Daniel W. 2001. Globalization and policy convergence. *International Studies Review* 3(1):53–78.

Drezner, Daniel W. 2005. Globalization, harmonization, and competition: the different pathways to policy convergence. *Journal of European Public Policy* 12(5):841–859.

Eckersley, Robyn. 2004. The green state. Rethinking democracy and sovereignty. Cambridge (MA) & London: The MIT Press.

Elkins, Zachary, and Beth A. Simmons. 2005. On waves, clusters, and diffusion: A conceptual framework. *The ANNALS of the American Academy of Political and Social Science* 598(1):33–51.

Esty, Daniel C. 2001. Bridging the trade-environment divide. *Journal of Economic Perspectives* 15(3):113–130.

Esty, Daniel C. 2011. Economic integration and environmental protection. In *The Global environment. institutions, law, and policy*. Third Edition, eds. Regina S. Axelrod, Stacy D. VanDeveer, and David Leonard Downie, 155-171. Washington: CQ Press.

Finnemore, Martha, and Kathryn Sikkink.1998. International norm dynamics and political change. *International Organization* 52(4):887–917.

Frank, David John. 1999. The social bases of environmental treaty ratification, 1900-1990. *Sociological Inquiry* 69(4):523–550.

Frank, David John, Ann Hironaka, and Evan Schofer. 2000. The nation-state and the natural environment over the twentieth century. *American Sociological Review* 65:96–116.

Frankel, Jeffrey A., and Andrew K. Rose. 2005. Is trade good or bad for the environment? Sorting out the causality. *Review of Economics and Statistics* 87(1):85–91.

Franzese, Robert J., JR., and Jude C. Hays. 2008. Interdependence in comparative politics. Substance, theory, empirics, substance. *Comparative Political Studies* 41(4/5):742–780.

Fredriksson, Per G., and Noel Gaston. 2000. Ratification of the 1992 climate change convention: What determines legislative delay? *Public Choice* 104:345–368.

Gallagher, Kevin P. 2009. Economic globalization and the environment. *Annual Review of Environment and Resources* 34(1):279–304.

Garrett, Geoffrey. 1998. Partisan politics in the global economy. Cambridge et al.: Cambridge University Press.

Garrett, Geoffrey. 2000. The causes of globalization. *Comparative Political Studies* 33(6/7):941–991.

Garrett, Geoffrey, and Peter Lange. 1996. Internationalization, institutions, and political change. In *Internationalization and domestic politics*, eds. Robert O. Keohane, and Helen V. Milner, 48–78. Cambridge et al.: Cambridge University Press.

Gilardi, Fabrizio. 2013. Transnational diffusion: Norms, ideas, and policies. In *Handbook of international relations*, eds. Walter Carlsnaes, Thomas Risse, and Beth A. Simmons, 453–477. Los Angeles et al.: Sage.

Gourevitch, Peter. 1978. The second image reversed: The international source of domestic politics. *International Organization* 32(4):881–912.

Graham, Erin R., Charles R. Shipan, and Craig Volden. 2012. Review article: The diffusion of policy diffusion research in political science. *British Journal of Political Science* 43:673–701.

Grande, Edgar. 2012. Die politische Kontingenz der Globalisierung. In *Politik und Kontingenz*, eds. Katrin Toens, and Ulrich Willems, 189–203. Wiesbaden: Springer VS.

Grossman, Gene M., and Alan B. Krueger. 1995. Economic growth and the environment. *The Quarterly Journal of Economics* 110(2):352–377.

Ha, Eunyoung. 2008. Globalization, veto players, and welfare spending. *Comparative Political Studies* 41(6):783–813.

Ha, Eunyoung. 2012. Globalization, government ideology, and income inequality in developing countries. *The Journal of Politics* 74(2):541–557.

Haas, Peter, M., and John A. Hird. 2013. Introduction: Understanding globalization. In *Controversies in globalization*, eds. Haas, Peter, M., and John A. Hird, xvii–lxiii. Los Angeles et al.: Sage & CQ Press.

Hafner-Burton, Emilie M., Jana von Stein, and Erik Gartzke. 2008. International organizations count. *Journal of Conflict Resolution* 52(2):175–188.

Hafner-Burton, Emilie M., and Kiyoteru Tsutsui. 2005. Human rights in a globalizing world: The paradox of empty promises. *American Journal of Sociology* 110(5):1373–1411.

Harnisch, Sebastian. 2013. Vergleichende Außen- und Sicherheitspolitik. In *Studienbuch Politikwissenschaft*, eds. Manfred G. Schmidt, Frieder Wolf, and Stefan Wurster, 411–438. Wiesbaden: Springer VS.

Harris, Paul G. 2000. Climate change: Is the United States sharing the burden? In *Climate change and American foreign policy*, ed. Paul G. Harris, 29–49. Houndmills et al. Palgrave Macmillan.

Harrison, Kathryn. 2010. The United States as an outlier: Economic and institutional challenges to US climate policy. In *Global commons, domestic decisions. The comparative politics of climate change*, eds. Kathryn Harrison, and Lisa McIntosh Sundstrom, 67–103. Cambridge & London: The MIT Press.

Harrison, Kathryn, and Lisa McIntosh Sundstrom. 2007. The comparative politics of climate change. *Global Environmental Politics* 7(4):1–18.

Harrison, Kathryn, and Lisa McIntosh Sundstrom. 2010a. Introduction: Global commons, domestic decisions. In *Global commons, domestic decisions. The comparative politics of climate change*, eds. Kathryn Harrison, and Lisa McIntosh Sundstrom, 1-22. Cambridge & London: The MIT Press.

Harrison, Kathryn, and Lisa McIntosh Sundstrom. 2010b. Conclusion: The comparative politics of climate change. In *Global commons, domestic decisions. The comparative politics of climate change*, eds. Kathryn Harrison, and Lisa McIntosh Sundstrom, 261–290. Cambridge & London: The MIT Press.

Hedström, Peter, and Richard Swedberg. 1998. Social mechanisms: An introductory essay. In *Social mechanisms. An analytical approach to social theory*, eds. Peter Hedström, and Richard Swedberg, 1–31. Cambridge et al.: Cambridge University Press.

Held, David, and Anthony McGrew. 2000. The great globalization debate: An *introduction. In the global transformations reader. An introduction to the globalization debate*, David Held, and Anthony McGrew, 1–50. Second Edition. Cambridge & Malden: Polity.

Held, David, Anthony McGrew, David Goldblatt, and Jonathon Perraton. 1999. Global transformations. Politics, economics and culture. Stanford (CA): Stanford University Press.

Henry, Laura A., and Lisa McIntosh Sundstrom. 2010. Russia and the Kyoto Protocol: From hot air to implementation. In *Global commons, domestic decisions. The comparative politics of climate change*, eds. Kathryn Harrison, and Lisa McIntosh Sundstrom, 105–138. Cambridge & London: The MIT Press.

Hoel, Michael, and Kerstin Schneider. 1997. Incentives to participate in an international environmental agreement. *Environmental and Resource Economics* 9(2):153–170.

Holzinger, Katharina, Helge Jörgens, and Christoph Knill. 2007. Transfer, Diffusion und Konvergenz: Konzepte und Kausalmechanismen. In *Transfer, Diffusion und Konvergenz von Politiken* (Politische Vierteljahresschrift Sonderheft, 38), eds. Katharina Holzinger, Helge Jörgens, and Christoph Knill, 11–35. Wiesbaden: VS Verlag für Sozialwissenschaften.

Holzinger, Katharina, and Christoph Knill. 2005. Causes and conditions of cross-national policy convergence. *Journal of European Public Policy* 12(5):775–796.

Holzinger, Katharina, Christoph Knill, and Thomas Sommerer. 2008. Environmental policy convergence: The impact of international harmonization, transnational communication, and regulatory competition. *International Organization* 62:553–587.

Jahn, Detlef. 2006. Globalization as ‘Galton's problem’: The missing link in the analysis of diffusion patterns in welfare state development. *International Organization* 60(2):401–431.

Jahn, Detlef. 2008. The politics of climate change. Paper prepared for delivery at the 2008 Joint Sessions of Workshops Friday 11th-Wednesday 16th April 2008 in Rennes (France) in the Workshop "The Politics of Climate Change" organized by Hugh Compston (Cardiff University). https://ecpr.eu/Filestore/PaperProposal/b230ae79-4191-48be-93d3-631a05c7b90f.pdf. Accessed 13 Nov 2019.

Jahn, Detlef. 2009. Globalisierung als Galton-Problem: Regionale und temporale Diffusionsschübe. In *Methoden der Vergleichenden Politik- und Sozialwissenschaft. Neuere Entwicklungen und Anwendungen*, eds. Susanne Pickel, Gert Pickel, Hans-Joachim Lauth, and Detlef Jahn, 87–112. Wiesbaden: VS Verlag für Sozialwissenschaften.

Jahn, Detlef. 2013. Einführung in die vergleichende Politikwissenschaft. 2. Auflage. Wiesbaden: Springer VS.

Jahn, Detlef. 2015. Diffusion. In *Handbuch Policy-Forschung*, eds. Georg Wenzelburger, and Reimut Zohlnhöfer, 247–276. Wiesbaden: Springer VS.

Jahn, Detlef. 2016a. Globalisierung und Vergleich. In *Handbuch Vergleichende Politikwissenschaft*, eds. Hans-Joachim Lauth, Marianne Kneuer, and Gert Pickel, 861–870. Wiesbaden: Springer VS.

Jahn, Detlef. 2016b. The politics of environmental performance. Institutions and preferences in industrialized democracies. Cambridge: Cambridge University Press.

Jahn, Detlef, and Sebastian Stephan. 2015. The problem of interdependence. In *Comparative politics. Theoretical and methodological challenges*, eds. Dietmar Braun, and Martino Maggetti, 14–54. Cheltenham & Northhamption, MA: Edgar Elgar Publishing.

Jänicke, Martin. 1998. Umweltpolitik: Global am Ende oder am Ende global? Thesen zu ökologischen Determinanten des Weltmarktes. In *Perspektiven der Weltgesellschaft*, ed. Ulrich Beck, 332–344, Frankfurt am Main: Suhrkamp Verlag.

Jänicke, Martin. 2005. Trend-setters in environmental policy: the character and role of pioneer countries. *European Environment* 15:129–142.

Jones, Andrew. 2010. Globalization: Key thinkers. Cambridge & Malden: Polity Press.

Kelemen, R. Daniel. 2000. Regulatory federalism: EU environmental regulation in comparative perspective. *Journal of Public Policy* 20(3):133–167.

Keohane, Robert O. 1996. Analyzing the effectiveness of international environmental institutions. In *Institutions for environmental aid*, eds. Robert O. Keohane, and Marc A. Levy, 3–27. Cambridge (MA) & London: The MIT Press.

Keohane, Robert, and Joseph Nye. 1989. Power and interdependence. World politics in transition. Boston: Little, Brown and Co.

Kerr, Clark. 1983. The future of industrial societies. Convergence or continuing diversity. Cambridge (MA) & London: Harvard University Press.

Kim, So Young, and Yael Wolinsky-Nahmias. 2014. Cross-national public opinion on climate change: The effects of affluence and vulnerability. *Global Environmental Politics* 14(1):79–106.

Knill, Christoph. 2005. Introduction: Cross-national policy convergence: concepts, approaches and explanatory factors. *Journal of European Public Policy* 12(5):764–774.

Knill, Christoph, Jale Tosun, and Stephan Heichel. 2008. Balancing competitiveness and conditionality: environmental policy-making in low-regulating countries. *Journal of European Public Policy* 15(7):1019–1040.

Lake, David A., and Robert Powell. 1999. International relations: A strategic-choice approach. In *Strategic choice and international relations*, eds. David A. Lake, and Robert Powell, 9–38. Princeton, New Jersey: Princeton University Press.

Li, Quan, and Rafael Reuveny. 2006. Democracy and environmental degradation. *International Studies Quarterly* 50(4):935–956.

Mahler, Vincent A. 2004. Economic globalization, domestic politics, and income inequality in the developed countries. A cross-national study. *Comparative Political Studies* 37(9):1025–1053.

Meyer, John W., David John Frank, Ann Hironaka, Evan Schofer, and Nancy Brandon Tuma. 1997. The structuring of a world environmental regime, 1870–1990. *International Organization* 51(4):623–651.

Milner, Helen V., and Robert O. Keohane. 1996. Internationalization and domestic politics: An introduction. In *Internationalization and domestic politics*, eds. Robert O. Keohane, and Helen V. Milner, 3–24. Cambridge et al.: Cambridge University Press.

Morin, Jean-Frédéric, Andreas Dür, and Lisa Lechner, Lisa. 2018. Mapping the trade and environment nexus: Insights from a new data set. *Global Environmental Politics* 18(1):122–139.

Neumayer, Eric. 2002. Does trade openness promote multilateral environmental cooperation? *The World Economy* 25(6):815–832.

Neumayer, Eric, and Thomas Plümper. 2012. Conditional spatial policy dependence. *Comparative Political Studies* 45(7):819–849.

O'Neill, Kate. 2009. The environment and international relations. Cambridge et al.: Cambridge University Press.

Peters, Dirk. 2007. Ansätze und Methoden der Außenpolitikanalyse. In *Handbuch zur deutschen Außenpolitik*, eds. Siegmar Schmidt, Gunther Hellmann, and Reinhard Wolf, 815–835. Wiesbaden: VS Verlag für Sozialwissenschaften.

Pinto, Pablo M. 2013. Partisan investment in the global economy. Why the left loves foreign direct investment and FDI loves the left. Cambridge et al.: Cambridge University Press.

Porter, Gareth. 1999. Trade competition and pollution standards: "Race to the bottom" or "stuck at the bottom"? *Journal of Environment & Development* 8(2):133–151.

Purdon, Mark. 2015. Advancing comparative climate change politics: Theory and method. *Global Environmental Politics* 15(3):1–26.

Rensmann, Lars. 2011. Politikwissenschaft. In *Globalisierung. Ein interdisziplinäres Handbuch*, eds. Andreas Niederberger, and Philipp Schnik, 106–121. Stuttgart & Weimar: Verlag J.B. Metzler.

Risse-Kappen, Thomas. 1994. Ideas do not float freely: transnational coalitions, domestic structures, and the end of the cold war. *International Organization* 48(2):185–214.

Rittberger, Volker, Andreas Kruck, and Anne Romund. 2010. Grundzüge der Weltpolitik. Theorie und Empirie des Weltregierens. Wiesbaden: VS Verlag für Sozialwissenschaften.

Roberts, J. Timmons, Bradley C. Parks, and Alexis A. Vásquez. 2004. Who ratifies environmental treaties and why? Institutionalism, structuralism and participation by 192 nations in 22 treaties. *Global Environmental Politics* 4(3):22–64.

Rudra, Nita, and Stephan Haggard. 2005. Globalization, democracy, and effective welfare spending in the developing world. *Comparative Political Studies* 38(9):1015–1049.

Ruoff, Gabriele. 2009. Grow rich and clean up later? Joint effects of IGO membership and democracy on environmental performance in developing countries. National Centre of Competence in Research (NCCR) (Challenges to Democracy in the 21st Century Working Paper 33).

Sachs, Jeffrey D., and Andrew Warner. 1995. Economic reform and the process of global integration. (Brookings Papers on Economic Activity 1).

Schirm, Stefan A. 2007. Globalization. State of the art and perspectives. London & New York: Routledge.

Scholte, Jan Aart. 2005. Globalization. A critical introduction. Second Edition. Houndsmills & New York: Palgrave Macmillan.

Simmons, Beth A. 2001. The international politics of harmonization: The case of capital market regulation. *International Organization* 55(3):589–620.

Simmons, Beth A., Frank Dobbin, Frank, and Geoffrey Garrett. 2006. Introduction: The international diffusion of liberalism. *International Organization* 60:781–810.

Simmons, Beth A., and Zachary Elkins. 2004. The globalization of liberalization: Policy diffusion in the international political economy. *American Political Science Review* 98(1):171–189.

Spilker, Gabriele. 2012. Helpful organizations: Membership in inter-governmental organizations and environmental quality in developing countries. *British Journal of Political Science* 42(2):345–370.

Spilker, Gabriele. 2013. Globalization, political institutions and the environment in developing countries. New York, London: Routledge.

Spindler, Manuela. 2010. Interdependenz. In *Theorien der Internationalen Beziehungen*. 3., überarbeitete und aktualisierte Auflage, eds. Siegfried Schieder, and Manuela Spindler, 97–130. Opladen & Farmington Hills: Verlag Barbara Budrich.

Tang, Jitao. 2015. Testing the pollution haven effect: Does the type of FDI matter? *Environmental and Resource Economics* 60(4):549–578.

Tiberghien, Yves, and Miranda A. Schreurs. 2010. Climate leadership, Japanese style: embedded symbolism and post-2001 Kyoto Protocol politics. In *Global commons, domestic decisions. The comparative politics of climate change*, eds. Kathryn Harrison, and Lisa McIntosh Sundstrom, 139–168. Cambridge & London: The MIT Press.

Tobey, James A. 1990. The effects of domestic environmental policies on patterns of world trade: An empirical test. *Kyklos* 43(2):191–209.

Tosun, Jale. 2015. Umweltpolitik. In *Handbuch Policy-Forschung*, eds. Georg Wenzelburger, and Reimut Zohlnhöfer, 641–662. Wiesbaden: Springer Fachmedien Wiesbaden.

Vogel, David. 1995. Trading up. Consumer and environmental regulation in a global environment. Cambridge (MA) & London.

Vogel, David. 2000. Environmental regulation and economic integration. *Journal of International Economic Law*, 265–279.
von Stein, Jana. 2008. The international law and politics of climate change. Ratification of the United Nations Framework Convention and the Kyoto Protocol. *Journal of Conflict Resolution* 52(2):243–268.
Ward, Hugh. 2006. International linkages and environmental sustainability: The effectiveness of the regime network. *Journal of Peace Research* 43(2):149–166.
Ward, Hugh, Xun Cao, and Bumba Mukherjee. 2014. State capacity and the environmental investment gap in authoritarian states. *Comparative Political Studies* 47(3):309–343.
Wenzelburger, Georg, and Reimut Zohlnhöfer. 2015. Konzepte und Begriffe in der Vergleichenden Policy-Forschung. In *Handbuch Policy-Forschung*, eds. Georg Wenzelburger, and Reimut Zohlnhöfer, 15–32. Wiesbaden: Springer VS.
Wheeler, David. 2001. Racing to the bottom? Foreign investment and air pollution in developing countries. *Journal of Environment & Development* 10(3):225–245.
Wilson, John Douglas. 1996. Capital mobility and environmental standards: Is there a theoretical basis for a race to the bottom? In *Free trade and harmonization. prerequisites for free trade. Volume 1. Economic analysis*, eds. Jagdish Bhagwati, and Robert F. Hudec, 393–427. Cambridge (MA) & London: The MIT Press.
Xu, Xinpeng. 2000. International trade and environmental regulation: Time series evidence and cross section test. *Environmental and Resource Economics* 17:233–257.
Yamagata, Yoshiki, Jue Yang, and Joseph Galaskiewicz. 2013. A contingency theory of policy innovation: how different theories explain the ratification of the UNFCCC and Kyoto Protocol. *International Environmental Agreements: Politics, Law and Economics* 13(3):251–270.
Young, Oran R., and Marc A. Levy. 1999. The effectiveness of international environmental regimes. In *The effectiveness of international environmental regimes. Causal connections and behavioral mechanisms*, ed. Oran R. Young, 1–32. Cambridge (MA) & London: The MIT Press.
Zohlnhöfer, Reimut. 2003. Der Einfluss von Parteien und Institutionen auf die Wirtschafts- und Sozialpolitik. In *Politische Ökonomie. Demokratie und wirtschaftliche Leistungsfähigkeit*, eds. Herbert Obinger, Uwe Wagschal, and Bernhard Kittel, 47–80. Opladen: Leske + Budrich.
Zohlnhöfer, Reimut. 2005. Globalisierung der Wirtschaft und nationalstaatliche Anpassungsreaktionen. Theoretische Überlegungen. *Zeitschrift für Internationale Beziehungen* 12(1):41–75.
Zohlnhöfer, Reimut. 2007. Fiscal policy and adjustment: adjusting fiscal policy to globalization – testing theoretical approaches. In *Globalization. State of the art and perspectives*, ed. Stefan A. Schirm, 40–60. London & New York: Routledge.
Zohlnhöfer, Reimut. 2015. Globalisierung. In *Handbuch Policy-Forschung*, eds. Georg Wenzelburger, and Reimut Zohlnhöfer, 199–224. Wiesbaden: Springer VS.
Zürn, Michael. 1998. Regieren jenseits des Nationalstaates. Globalisierung und Denationalisierung als Chance. Frankfurt am Main: Suhrkamp Verlag.
Zürn, Michael. 2002. From interdependence to globalization. In *Handbook of international relations*, eds. Walter Carlsnaes, Thomas Risse, and Beth A. Simmons, 235–254. London et al.: Sage Publications.
Zürn, Michael. 2013. Globalization and global governance. In *Handbook of international relations*, eds. Walter Carlsnaes, Thomas Risse, and Beth A. Simmons, 401–425. Los Angeles et al.: Sage.

4 Domestic political institutions and climate commitment and performance

Abstract

Three research traditions have investigated the moderation effects of domestic political institutions on the influence of globalisation: the veto-player approach, the political-corruption approach, and the regime-type approach. To formulate additional hypotheses on the joint relationship between globalisation and domestic political institutions, this chapter examines the impact of veto players, political corruption, and regime type on climate commitment and performance. As the veto-player approach also emphasises the importance of political parties in government, this chapter addresses the influence of government ideology. It is important to analyse the effect of these political institutional variables on climate commitment and performance at a disaggregated level. The veto-player approach discusses the importance of ideological distance among veto players, as well as veto points for climate commitment and performance. There is no agreement on whether specific veto points have uniform effects (government fragmentation, presidentialism, or bicameralism/federalism). While the literature assumes that political corruption among political decision-makers and public officials undermines climate commitment and performance, their relative importance is unclear. Democracies and autocracies are likely to differ systemically in the ratification of soft international treaties such as UNFCCC. No uniform effect of democratic quality dimensions (vertical and horizontal accountability; political and civil rights) on Kyoto Protocol ratification and climate performance can be assumed. Based on these conclusions, the following chapter argues that the moderation effects of domestic political institutions should also be studied at a disaggregated level.

Does the effect of international integration on climate commitment and performance depend on domestic political institutions? The last chapter identified three research traditions that have investigated the possible moderation effects of domestic political institutions: the veto-player approach, the literature on a joint effect of political corruption and international integration, and the literature on differences between democracies and autocracies in relation to globalisation. These research traditions have built on the literature on veto players, political corruption, and regime type and the environment. This chapter examines these literatures and formulates hypotheses on the effects of veto players, political corruption, and regime type on climate commitment and performance. As the veto-player approach also refers to the literature on political parties and the environment, when considering the policy preferences of veto players (e.g., Zohlnhöfer, 2005), this chapter reviews that literature as well. This makes it possible to formulate hypotheses on the joint influence of international economic and political integration and domestic political institutions in the next chapter.[34] As the three approaches vary in their understanding of domestic political institutions, the chapters also discuss the conceptualisation of veto players, political corruption, and regime type. In accordance with the conclusion of Chapter 2, separate hypotheses relate to UNFCCC and Kyoto Protocol ratification, as well as developed and developing countries. As explained in Chapter 3, climate is examined in the empirical analysis (Chapters 7 and 8) for the pooled and developing countries sample, but not separately for developed countries. The developed-country sample consists only of democracies (see Chapter 6). For this reason, the regime-type approach is applied only to the pooled sample of developed and developing countries and to the developing-country sample in the statistical analysis. Accordingly, this chapter formulates hypotheses based on the regime-type approach for the pooled and developing-country samples.

This chapter argues that it is important to analyse the effect of veto players, political corruption, and regime type on climate commitment and performance at a disaggregated level. Based on this conclusion, the following chapter shows that the same applies to analyses of the joint influence of globalisation and domestic political institutions. From the perspective of veto player theory, comparative climate policy research examines the effect of ideological heterogeneity among veto players and democratic institutional constraints (veto points). There is no agreement on whether specific veto points have uniform effects (government fragmentation, presidentialism, and bicameralism/federalism). For this reason, specific veto points must be studied separately. While the literature generally assumes that political corruption among political decision-makers and public officials undermines climate commitment and performance, their relative importance is unclear. While democracy and autocracies are assumed to differ systemically in their ratification of soft international treaties such as UNFCCC, no uniform effect of democratic quality dimensions (vertical and horizontal accountability, political and civil rights) on Kyoto Protocol ratification or climate performance can be assumed.

[34] The multivariate analysis controls other relevant political institutional explanatory factors (see Chapter 6).

4.1 Political parties and climate commitment and performance

To explain state responses to globalisation, the veto-player approach considers policy preferences using party-difference theory[35] (Hibbs, 1992; Zohlnhöfer, 2005) (see Chapter 3). This chapter, therefore, focuses on political parties and climate commitment and performance. Political institutions alone cannot explain a country's climate commitment and performance (Desai, 2002, p. 7; Harrison & Sundstrom, 2010a, p. 17). They merely enable or restrict political decision-makers (Schmidt & Ostheim, 2007b, p. 70; Zohlnhöfer, 2008, p. 161).[36] Party-difference theory states that a cross-national variation in policy outputs and outcomes results from differences in the party composition of national governments (Hibbs, 1992, pp. 261f.; Schmidt, 1996, p. 155; Schmidt & Ostheim, 2007a, p. 51; Wenzelburger & Neumann 2015, p. 256). This section discusses the theoretical and empirical literature on political parties and climate commitment and performance, formulating hypotheses for the following discussion on joint effects with globalisation.

4.1.1 Conceptualisation of party influence

There are two variants of party-difference theory. According to the original version of partisan-difference theory (Hibbs, 1992, 1977), political parties act in accordance with the socio-economic interests of their constituents to secure (re-)election (Hibbs, 1992, pp. 361ff.; Hibbs, 1977, p. 1470; Schmidt, 1996, p. 156; Schmidt & Ostheim, 2007a, pp. 51f.). They represent social groups with divergent socio-economic interests. Zohlnhöfer (2005, p. 53) argues that the members of political parties share values and assumptions about cause-and-effect relationships. Thus, political parties act in accordance with their own ideological preferences. As will be shown in the next section, theoretical arguments on the relationship between political parties and climate commitment and performance refer to both variants of party-difference theory. Zohlnhöfer (2005, p. 55) argues that strategic considerations matter more when policy decisions are crucial for elections. Climate or environmental protection is not a priority for most voters (Harrison & Sundstrom, 2010a, p. 3).[37] Thus, the ideas and values of political parties also impact their climate-policy preferences (e.g., Harrison & Sundstrom, 2010a, pp. 3, 15). Since reducing greenhouse gas emissions produces winners and losers in the short-term, as a result of climate change mitigation, the socio-economic interests of the electorate are presumed to be more important for climate performance and the ratification of the Kyoto Protocol for Annex I countries.

4.1.2 Review of the theoretical literature

Possible party effects on climate commitment and performance are discussed in the left/right dimension and the green/growth dimension (e.g., Garmann, 2014; Jahn, 2016a; Jensen & Spoon, 2011, 2006; see also Carter, 2013, p. 74). Assuming that political parties differ in their policy preferences because of the socio-economic interests of their voters, the literature is unclear regarding the climate-policy preferences of left- and right-wing parties[38]. Left-wing parties may be reluctant to introduce and implement climate policies. Workers employed in industrial sectors, which are negatively impacted by reductions in greenhouse gas emissions, and their labour unions are likely to oppose climate protection (Garmann, 2014, p. 2; Lim & Duit, 2018, p. 221; Neumayer, 2003, p. 204). Left-wing parties may cater to their traditional voters by focusing on employment and economic growth (Knill et al., 2010, p. 304; Neumayer, 2003, p. 206). In addition, left-wing voters may pay more climate change mitigation costs (e.g., via energy prices) than their right-wing counterparts (Garmann, 2014, p. 2; Lim & Duit, 2018, p. 222). Garmann (2014, p. 2) has observed that private households often face a higher environmental tax burden than business owners. Simultaneously, traditional left-wing voters, i.e. workers and the poor, are more vulnerable to global environmental change (Garmann, 2014, p. 2; Lim & Duit, 2018, p. 221; Neumayer, 2003, p. 205). Additionally, traditional left-wing parties are expected to act strategically to prevent left-libertarian or green parties from gaining voter support (Neumayer, 2003, p. 204). This is particularly true in countries with electoral laws that favour small parties (Neumayer, 2003, pp. 204f.). Scruggs (1999, p. 10) notes that ENGOs often cooperate with left-wing parties. The theoretical literature is also unclear regarding the climate-policy preferences of right-wing parties. Right-wing parties represent capital owners in the political system (Garmann, 2014, p. 29). They may decline to ratify climate agreements and measures to reduce greenhouse gas emissions because these imply higher taxes and production costs (Dunlap & Allen, 1976, p. 384; Garmann, 2014, p. 2; Harrison, 2007, p. 95; Lim & Duit, 2018, p. 221). However, businesses can profit from environmental regulations via production efficiency and economic

[35] also Partisan Theory (Hibbs, 1992)

[36] Simultaneously, it is important to consider political institutions when analysing government ideology related to climate commitment and performance (Jensen & Spoon, 2011, pp. 101f.; Pinto, 2013, p. 30; Wenzelburger & Neumann, 2015, p. 257). They limit the government's potential opportunities for policy change (Pinto, 2013, p. 30).

[37] More recently, awareness of the consequences of global warming have contributed to a politicisation of the climate crisis.

[38] The assumption that the electorate can be divided into social groups with common interests and voting preferences has been challenged (e.g., Zohlnhöfer, 2005, p. 52).

competitiveness (Lim & Duit, 2018, p. 222; Vogel, 1995, pp. 250f.). Finally, climate-policy preferences vary among economic sectors.

There is no agreement on the effect of left- or right-wing parties, based on their ideological policy preferences. Left-wing parties share the assumption that state interventions are necessary to correct market failures (Zohlnhöfer, 2008, pp. 159f.). Right-wing parties regard them as dysfunctional (Schmidt, 2001, no page number) and prefer market solutions (Schmidt, 2001, no page number). Thus, left-wing parties are more willing to undertake the market interventions and changes to the economic system needed to tackle global warming (Garmann, 2014, p. 2; Harrison & Sundstrom, 2007, p. 8; Harrison & Sundstrom, 2010a, p. 16). Right-wing parties prefer economic efficiency (Schmidt, 2001, no page number) and voluntary market solutions to binding greenhouse gas emissions reduction targets (Harrison & Sundstrom, 2010a, p. 16). Left-wing parties may also be more committed to international climate policy and perform better in climate change mitigation, as they are more open to international cooperation and value distributive equality on the domestic and international level (Harrison & Sundstrom, 2010a, p. 15; Schmidt, 2001, no page number; Thérien, 2002, p. 450). Accordingly, left-libertarian and green parties that support environmental protection come from the left-wing political spectrum (Neumayer, 2003, p. 205). Yet, left-wing parties also value economic growth, in accordance with socialism (Jahn, 1998, p. 121; Touraine et al., 1987, pp. 26ff.). In fact, Lim and Duit (2018, p. 224) have argued, based on empirical studies, that environmental issues are more important to young urban citizens with high levels of education than to traditional left- and right-wing voters.

In sum, the effect on climate commitment and performance of political parties in government on a left/right scale is theoretically ambiguous (see also Garmann, 2014, p. 2). The climate policy of left- and right-wing parties may be context and situation specific. Lim and Duit (2018, p. 222) have argued that both left- and right-wing parties adopt environmental-protection policies if there are few costs involving workers and businesses (e.g., job loss, bureaucratic costs) and few opportunity costs. They argue that left-wing governments in redistributive welfare states are more likely to protect the environment because social welfare reduces costs for workers (Lim & Duit, 2017, pp. 224f.). Right-wing parties in less redistributive welfare states are more likely to adopt environmental measures (Lim & Duit, 2017, pp. 224f.). Finally, Christian-democratic parties and religious parties are differentiated from right and left-wing parties. These parties may favour environmental protection over economic growth (Knill et al., 2010, p. 304). Carter (2013) has found that left-wing parties are more environmentally friendly than right or Christian-democratic parties, but that European centre-right parties are also open to environmental issues. The literature uniformly assumes that, based on their policy preferences, green and left-libertarian political parties are more likely than other parties to prioritise environmental protection, including the reduction of greenhouse gas emissions over economic growth (Carter, 2013, p. 75; Garmann, 2014, p. 1; Jensen & Spoon, 2011, p. 101; Kitschelt, 1988, p. 198; Neumayer, 2003, p. 205). It is important to distinguish between the parliamentary strength of left-wing and left-libertarian parties. ‘Given that green parties are minority parties in all countries, the effect is likely to work through forcing other parties and governments to take environmental demands seriously’ (Neumayer, 2003, p. 218).

To conclude, while scholars agree that green and left-libertarian parties in government are likely to be more willing than other parties to commit to climate cooperation and to mitigate global warming, the effect of left-wing and right political parties in government is context-dependent. To ensure re-election, left-wing parties are likely to support climate protection when few costs are involved. There is a lack of research on partisan differences in climate commitment and performance in developing countries (Garmann, 2014, p. 9). Party-difference theory has been developed in the context of Western industrialised democracies. Second, party systems may not be comparable among world regions. However, the left/right dimension is regarded as the basic political-conflict dimension in nearly all countries worldwide (Huber & Inglehart, 1995, pp. 73, 90; Imbeau et al., 2001, p. 6). While classic party-difference theory assumes that governments have the capability to realise their policy preferences (Schmidt, 1996, p. 156, 162; Wenzelburger & Neumann 2015, p. 256; Zohlnhöfer, 2008, pp. 159), most scholars acknowledge that other variables, such as globalisation (Wenzelburger & Neumann, 2015, p. 259; Zohlnhöfer, 2008, p. 160) have an impact. It is therefore relevant to study the extent to which political parties make a difference under conditions of international integration.

4.1.3 Empirical research

Few quantitative studies have considered party ideology as an explanatory factor in the commitment to climate cooperation (e.g., Garmann, 2014, p. 9). Case studies show that government ideology in the left/right dimension only influenced some countries in their Kyoto Protocol ratification (e.g., Harrison & Sundstrom, 2010a; Harrison & Sundstrom, 2007, p. 8). Harrison and Sundstrom (2010a, 2007) have concluded that left-wing parties were more willing to ratify international climate treaties in North America and Europe. European Social Democrats supported climate cooperation and climate change mitigation more than centre and right-wing parties did (Harrison & Sundstrom, 2007, p. 8). US President Clinton and the Canadian liberal government of Jean Chrétien supported Kyoto Protocol ratification (Harrison, 2007, p. 95; Harrison & Sundstrom, 2007, p. 96). The conservative

government of Stephen Harper reduced Canada's climate change commitments (Harrison & Sundstrom, 2007, p. 96). There were left-wing parties that opposed climate cooperation and right-wing parties in government and parliament that supported the ratification of climate change (Harrison & Sundstrom, 2010b, pp. 271f.). Democrats and Republicans in the US Congress opposed the ratification of the Kyoto Protocol (Harrison, 2007, pp. 95f.). They were influenced by trade unions, which did not want to ratify the Kyoto Protocol (Harrison, 2007, p. 99). In some countries, government ideology has no impact (e.g., Russia and China) (Harrison & Sundstrom, 2010b, p. 271). Its effects also depend on the institutional context. President Clinton was unable to ratify the Kyoto Protocol without the agreement of the US Congress (Harrison, 2007, p. 96). The lack of party discipline in the US Congress makes Republican and Democratic senators focus on local business interests (Harrison, 2007, p. 96). Liberal members of the Canadian parliament, who were sceptical of climate protection, had to vote with the party line for Kyoto Protocol ratification (Harrison, 2007, p. 96).

Case studies confirm that green parties contribute to climate protection, but they have ambiguous findings with regard to left/right-wing parties. The Australian Green party has used its power in the Senate to introduce climate change mitigation policies (Crowley, 2007, p. 127). Left-wing parties have been more willing to reduce greenhouse gas emissions in North America and Europe (Harrison & Sundstrom, 2010b, p. 271). The Labour government of Tony Blair and Gordon Brown introduced ambitious climate-protection policies in the UK (Carter & Jacobs, 2014, p. 125). In the US, Democrats are more in favour of climate change mitigation; the values of Clinton and Gore led to the acceptance of high emissions reductions in the Kyoto Protocol negotiations (Harrison, 2010, p. 76, 81). They knew that the Kyoto Protocol would not pass the Senate. They may, therefore, have pursued a symbolic policy (Bang et al., 2012, pp. 759f.). Republican politicians have questioned human-caused climate change (Harrison, 2010, p. 75). The conservative government of Howard in Australia prioritised economic growth and economic competitiveness over climate protection and questioned climate change, under pressure from the fossil-fuel industry (Crowley, 2007, p. 125, 136). Jensen and Spoon (2011, p. 110) have found that both left- and right-wing parties within the EU support or reject environmental protection. In Australia, conflicts within the Labour Party and with trade unions prevented a common position on climate change (Crowley, 2007, p. 123; Harrison & Sundstrom, 2010b, p. 270). Later the Australian Labour Party supported climate cooperation and state interventions in the market to reduce climate change (Crowley, 2007, p. 123). The Canadian New Democratic Party opposed the introduction of taxes on CO_2 emissions (Harrison & Sundstrom, 2010b, pp. 271f.). Accordingly, both centre and right-wing parties can support climate change protection. For instance, the Republican state government of Arnold Schwarzenegger (California) and Pataki (New York), as well as the German Christian Democrats and the French UMP, have supported climate change mitigation because of electoral incentives (Harrison & Sundstrom, 2010b, p. 272). Climate scepticism is not shared by all conservative-party members in the US and Australia (Crowley, 2007, p. 125; Harrison, 2010, p. 93f.).

Previous quantitative studies of variation in climate performance have focused on developed countries (see Table 4.1) (e.g., Garmann, 2014; Jahn, 2008; Jensen & Spoon, 2006, 2011; Madden, 2014). Studies have applied cross-sectional (e.g., Jensen & Spoon, 2011, 2007) or pooled cross-sectional regression analyses (e.g., Garmann, 2014; Jahn, 2008; Jensen & Spoon, 2011, 2007; Madden, 2014). Tobin (2017) has used a fuzzy-set qualitative comparative analysis (fsQCA). Party ideology is captured either using the share of seats held by political parties in government (e.g., Garmann, 2014; Tobin 2017) or parliament (e.g., Garmann, 2014) or by the left/right or green/growth position of government or parliamentary political parties, based on party manifesto data. The latter performs better with regard to validity, but data are lacking for developing countries. Statistical results suggest that left-wing parties are more likely to contribute to climate performance. Garmann (2014) and Neumayer (2003) have observed that left-wing parties in government decrease the growth (Garmann, 2014) and levels of CO_2 emissions per capita (Neumayer, 2003, pp. 214f.). Jahn (2008) has found that left-wing government involvement decreases industrial CO_2 emissions only. Tobin (2017) concludes that left-wing government ideology is a sufficient condition for an ambitious climate policy. Neumayer (2003, p. 214f.) has shown a negative effect of left-wing seat share and green or left-libertarian parties in parliament on CO_2 emissions per capita. Left-wing parties may be more willing to protect the environment when they are in parliament, rather than in government (Neumayer, 2003, p. 218). Garmann (2014) has found that centre government parties contribute to more CO_2 emissions reductions than left-wing parties.

Table 4.1 Quantitative research on political parties and climate performance

Study	Dependent variable/s	Political parties	Effect
Neumayer, 2003	CO_2 emissions	Left party strength in government	+
		Left party strength in parliament	+
		Left-libertarian party strength in parliament	+
Jahn, 2008	CO_2 emissions	Green government ideology	+
	Industry specific CO_2 emissions	Left government ideology	+
Jensen & Spoon, 2011	Compliance with emissions targets	Pro-environmental positions of government parties	+
		Green parties in government	+
		Green parties in parliament	/
Garmann, 2014	Growth of CO_2 emissions	Left parties	+
		Centre parties	+
Madden, 2014	Adoption of climate policies	Pro-environmental positions of government parties	-
		Green parties in parliament	/

Notes: + positive effect, / no effect, - negative effect on climate performance.

The results are ambiguous with regard to the green/growth dimension. Green governments are associated with an annual reduction in total CO_2 emissions (Jahn, 2008); they contribute to the convergence of CO_2 emissions with the greenhouse gas emissions target of EU countries (Jensen & Spoon, 2011). By contrast, Madden (2014) has found that more pro-environment governments adopt fewer climate policies. However, there is no independent effect of the number of green party seats in the legislature on the adoption of climate policies. With regard to the latter, Jensen and Spoon (2011, p. 108) have reached the same conclusion on the environmental policy positions of political parties in government: depending on their environmental policy preferences, government parties may react in different ways to green-party strength in parliament (Jensen & Spoon, 2011, p. 109). Garmann (2014) has observed that party effects were stronger in the 1990s. Climate awareness and green political parties may have contributed to a convergence of political positions on climate change over time in the developed world (Garmann, 2014, p. 6). In recent times, climate protection has become more polarised in the left/right scale in public opinion and among politicians, especially in the US (Dunlap et al., 2016; Tobin, 2017, p. 13).

4.1.4 Conclusions

Table 4.2 summarises the hypotheses based on the literature review. While green and left-libertarian parties are more likely to ratify international climate agreements and contribute to climate performance, no clear effect of political parties in government and parliament in the left/right dimension on climate commitment and performance in developed and developing countries can be assumed. Left-wing parties in government tend to contribute more to climate commitment and performance. Differences in the partisan ideologies of governments may have less impact on UNFCCC ratification, which costs far less than Kyoto Protocol ratification. The database limits the analysis of party effects. The focus lies on the left/right dimension. The empirical analysis of climate commitment also considers left-libertarian parties in government.

Table 4.2 Political parties and climate commitment and performance

	UNFCCC		**Kyoto Protocol**		**Climate Performance**	
	Developed countries *Developing countries*		Developed countries *Developing countries*		Developed countries *Developing Countries*	
Left parties in government	$H_{Party}1.1.1$	/	$H_{Party}1.2.1$	/	$H_{Party}1.3.1$	/
	$H_{Party}1.1.2$	/	*$H_{Party}1.2.2$*	/	*$H_{Party}1.3.2$*	/
Right parties in government	$H_{Party}2.1.1$	/	$H_{Party}2.2.1$	/	$H_{Party}2.3.1$	/
	$H_{Party}2.1.2$	/	*$H_{Party}2.2.2$*	/	*$H_{Party}2.3.2$*	/
Centre parties in government	$H_{Party}3.1.1$	/	$H_{Party}3.2.1$	/	$H_{Party}3.3.1$	/
	$H_{Party}3.1.2$	/	*$H_{Party}3.2.2$*	/	*$H_{Party}3.3.2$*	/
Left-libertarian parties in government		+		+		+
		+		+		+

Notes: + positive effect, / no effect, - negative effect on climate commitment/ performance..

It is important to distinguish between political parties in government and parliament (see also Neumayer, 2003, p. 218). Finally, Lim and Duit (2018) argue that political parties influence environmental policy only in the long term.

4.2 Veto players and climate commitment and performance

This study examines whether veto players moderate the effect of globalisation on climate commitment and performance. This chapter examines the conceptualisation of veto players (4.2.1) and discusses the theoretical (4.2.2) and empirical literature (4.2.3), as well as formulating hypotheses (4.2.4).

4.2.1 Conceptualisation of veto players

Veto player theory refers to theoretical approaches that share the assumption that individual or collective actors, with the ability to block political decisions, use their veto power to realise their preferences (Ganghof, 2003, p. 2; Tsebelis, 2010, p. 4; Tsebelis, 2002, p. 2). The most influential veto-player approach comes from Tsebelis (2002; 1995). It aims to explain the (political) stability of public policies (Tsebelis, 2010, p. 4; Tsebelis, 2002, pp. 1, 6f., 21; Tsebelis, 1995, p. 292; Wenzelburger & Zohlnhöfer, 2014, p. 318).[39] Tsebelis (1995, p. 293) describes veto players as 'individual or collective actor[s] whose agreement is required for a policy decision' (see also Tsebelis, 2002, pp. 2, 4, 19). Veto player theory distinguishes between institutional and partisan actors that can block political decisions (Tsebelis, 2002, p. 2; Tsebelis, 1995, p. 302).

Institutional veto players are individual or collective actors with veto powers defined in the constitution (Tsebelis, 2002, pp. 2, 19, 79; Tsebelis, 1995, p. 302). The president (Zohlnhöfer, 2005, p. 49), the government (Birchfield & Crepaz 1998, p. 181), the lower chamber (Birchfield & Crepaz 1998, p. 181) and the upper chamber of the legislature (Birchfield & Crepaz 1998, p. 181; Zohlnhöfer, 2005, p. 49), federalism (Birchfeld & Crepaz 1998, p. 181), the electoral system (Birchfield & Crepaz 1998), constitutional courts (Jahn & Müller-Rommel, 2010, p. 24) and public referenda (Jahn & Müller-Rommel, 2010, p. 24; Stadelmann-Steffen, 2011, p. 488; Zohlnhöfer, 2005, p. 49) are all described as possible institutional veto players in democracies. Following Jahn (2010), this study focuses on the most important potential veto players: the president, the coalition government, and the first and the second chamber of the legislature. Federalism is not considered, as it is redundant to the upper chamber of the legislature (Jahn, 2010, p. 49). Bicameralism indicates that the central government and federal states must decide together (Wälti, 2004, p. 607). Immergut and Orlowsky (2013, p. 207) note that federalism has a separate effect when it impacts financial resources in a policy field (see also Wenzelburger & Zohlnhöfer, 2014, p. 320; Zohlnhöfer, 2003, p. 257) and/or if there is a joint political decision-making process involving central and state government. It is plausible to expect this to affect climate commitment and performance. Bicameralism does not measure the autonomy of federal states in policy fields, or their fiscal independence from the federal government (Wälti, 2004 p. 607). Given the available data, it is not possible to consider federalism in the present empirical analysis. It should therefore be considered in further research. Constitutional courts and public referenda are not included, since they can only block policy decisions when called or ordered to (Zohlnhöfer, 2003, p. 256f.). Moreover, appointed judges often have the same policy preferences as the government (Zohlnhöfer, 2003, pp. 256f.).

[39] It makes no statements regarding the direction of policy change (Tsebelis, 2002, p. 17).

Electoral systems have no direct effect on policy output. Their effect is mediated by institutional and partisan veto players.[40] It is important to note that the status of institutional veto players varies in international treaty ratification (e.g., between UNFCCC and Kyoto Protocol ratification) and domestic policy (e.g., climate performance). This has been neglected in empirical research (see Chapter 4).
Partisan veto players are political parties within institutional veto players (Tsebelis, 2002, p. 79; Tsebelis 1995, p. 302; Zohlnhöfer, 2005, p. 409). Veto player theory makes no assumptions about the content of their preferences (Ganghof, 2003, p. 8). Tsebelis (2002 pp. 2, 20) assumes a spatial policy model, which implies that partisan veto players choose political options that are close to their own policy preferences (Wenzelburger & Zohlnhöfer, 2014, p. 317). Furthermore, veto players do not distinguish between policy alternatives with the same distance from their ideal policy output (circular indifference curves) (Tsebelis, 2002, p. 20).

4.2.2 Review of the theoretical literature

While previous research has mainly investigated environmental and climate performance, the underlying theoretical arguments are relevant to an analysis of a country's climate commitment. The ratification of climate treaties depends on the domestic political decision-making process (Schulze, 2014, p. 120). Fredriksson and Ujhelyi (2006, p. 1) have rightfully noted the implication that veto players can block the ratification process. Accordingly, institutionalist explanatory approaches have also been used to analyse country differences in environment commitment (e.g., Fredriksson & Ujhelyi, 2006). Based on veto player theory and veto point theory scholars argue that the higher the number of institutional and partisan veto players and the higher their ideological heterogeneity, i.e. the more divergent policy preferences among veto players, the fewer state efforts there will be to protect the global environment (e.g., Fuchs et al., 2009, p. 12; Knill et al., 2010, p. 306; Madden, 2014, p. 571).
Many researchers have focused on the effect of the number of veto players (veto points) and environmental or climate commitment and performance (e.g., Fuchs et al., 2009, p. 12; Knill et al., 2010, p. 306). A high number of veto points implies that more actors can block efforts to mitigate climate change (Beer, 1998, no page number; Madden, 2014, p. 571; Poloni-Staudinger, 2008, p. 412), offering more opportunities for opponents of climate protection to prevent participation in climate cooperation (Harrison & Sundstrom, 2007, p. 9). This makes compromise necessary (Rechia, 2002, p. 475; Scruggs, 1999, p. 10); it is often associated with the conflicting policy preferences of political decision-makers (Madden, 2014, p. 571). Moreover, in countries with many veto players, industry lobbying against the ratification of climate agreements tends to be more influential than environmentally friendly pressure from ENGOs (Fredriksson & Ujhelyi, 2006, p. 2). Industry representatives only need the support of a single veto player (Fredriksson & Ujhelyi, 2006, p. 2). The presence of many veto players can significantly impede ambitious climate policies that imply high costs (Fuchs et al., 2009, p. 12) for a small number of polluters (Madden, 2014, pp. 575f.). The assumption that centralised power and a low number of veto players contributes to solving environmental problems is shared by the Environmental Authoritarianism literature (e.g., Beeson, 2018, 2016, 2010; Gilley, 2012). By contrast, from the perspective of veto player and point theory scholars, the number of veto points might also increase environmental protection. The more veto players, the more opportunities for non-state actors to influence policy actors (Fiorino, 2011, p. 381). It 'may even create a competitive dynamic among institutions and levels of government that facilitate change' (Fiorino, 2011, p. 381). This argument has also been made, based on Lijphart's (2012 [1999]) distinction between consensual and majoritarian democracies (e.g., Poloni-Staudinger, 2008, p. 412). Consensual institutions 'aim at broad participation in government and broad agreement on the policies that the government should pursue' (Lijphart, 2012 [1999], p. 2). They are characterised by the distribution of political power. Consensual democracies represent minority groups better, include more interests in the political decision-making process, and enable green parties to compete for power (Poloni-Staudinger, 2008, p. 412). Thus, they provide more incentives for the government to consider a range of interests, i.e. the policy preferences of the entire electorate (e.g., Harrison & Sundstrom, 2007, p. 16; Fredriksson & Wollscheid, 2007, p. 382; Knill et al., 2010, p. 306; Poloni-Staudinger, 2008, p. 412). Climate change mitigation has been described as "the diffuse problem *par excellence*" (Mercier, 2006, p. 105; emphasis in original). By contrast, majoritarian institutions favour special-interest groups (Fredriksson & Wollscheid, 2007, p. 382; Knill et al., 2010, p. 306). In sum, there is no consensus in the theoretical debate on the relationship between political-institutional constraints and climate commitment and performance.
More recently, climate-performance studies have considered the ideological heterogeneity of veto players (e.g., Jahn, 2016; Jensen & Spoon, 2011). This literature assumes that the more divergent the policy preferences among veto players, the worse a country's climate performance (e.g., Jahn, 2016, pp. 171f.; Jensen & Spoon, 2011, p. 102). The importance of the policy preferences of veto players in relation to the left/right and green/growth dimensions has been studied (e.g., Jahn, 2016, pp. 172f.). Jahn (2016, p. 174) argues that it is theoretically ambiguous which dimension is more important for the environment. Jensen and Spoon (2011, p. 102) suggest that the more divergent the government positions on environmental issues, the less likely it is that the government will adopt

[40] Relevant political institutions, which are not veto players, are treated as a control variables.

policy measures to achieve the Kyoto Protocol greenhouse gas emissions target. Jensen and Spoon (2011, p. 110) have observed that 'the left-wing and right both have parties that emphasize the environment and those that do not.' Nonetheless, it is important to study this dimension as well as 'the left-right dimension represents the semantics of established politics' (Jahn, 2016, p. 174). In sum, while we can assume that policy divergence in the green/growth dimension undermines climate commitment and performance, the effect in the left/right-dimension is theoretically ambiguous.

In contrast to the holistic approach of veto player theory, many publications focus on specific political institutions. The following section discusses the effect of specific veto points, focusing on the most important: government fragmentation, presidentialism, and bicameralism (see previous section).[41]

According to veto player theory, **government fragmentation** makes the adoption of climate policies less likely. On the one hand, more veto points imply higher decision costs (Garmann, 2014, pp. 2f.). Persson et al. (2007, p. 157) argue that voters can distinguish between different coalition parties. As climate change mitigation is associated with losers and winners, it also makes it more likely that veto players will have divergent economic and environmental interests. Because of electoral competition, government parties may focus on policies that have an immediate effect on their voters' wellbeing. Minority governments must make compromises for the majority and focus less on implementing their own policy preferences (Garmann, 2014, p. 3). On the other hand, a larger number of government parties increases the likelihood that diffuse policy preferences will be represented. Garmann (2014, p. 3) observes that it may be easier for coalition governments to adopt unpopular policies, such as greenhouse gas emissions reductions, because accountability is lower than in single-party governments. In sum, the effect of government fragmentation on climate commitment and performance is an empirical question.

From the perspective of veto player theory, higher levels of legislative centralisation and cohesion in parliamentary systems (Dolšak, 2001, p. 419; Fredriksson & Wollscheid, 2007, p. 382) make it easier for governments to ratify international climate treaties and adopt climate policies than it is for presidential democracies (Christoff & Eckersley, 2011, p. 440; Lantis, 2009, p. 8f.). Wurster (2013, pp. 80f.) assumes that semi-presidential democracies perform less well in ecological sustainability than either **presidential** or **parliamentary systems,** as they are characterised by a higher number of veto players. In addition, parliamentary governments must provide more public goods than presidential systems (e.g., Persson & Tabellini, 1999; Persson et al., 2000). Competition in parliamentary systems is often lower than in presidential systems because the government is supported by most of the legislature (Persson & Tabellini, 1999, p. 721). Moreover, as political authorities depend on the cooperation of political parties and the support of most voters, governments are obliged to provide public goods (Persson & Tabellini, 1999, p. 721; Persson et al., 2000, p. 1126; Ward, 2008, p. 402). In presidential systems, the independent legislative and executive elections enable voters to discipline political decision-makers (Persson et al., 2000, p. 1126). The separation of powers creates competition among voters and politicians in presidential systems (Persson & Tabellini, 1999, pp. 703f., 719; Persson et al., 2000, p. 1126), as well as bargaining between the legislative and the executive branches (Christoff & Eckersley, 2011, p. 440). This 'gives too many opportunities for economic special interests to scupper environmental initiatives' (Ward, 2008, p. 406). Consequently, presidential democracies underprovide public goods as they focus on a minority of voters (Persson & Tabellini, 1999, pp. 719, 721).

By contrast, according to selectorate theory (Bueno de Mesquita et al., 2003) presidential systems are more committed to climate cooperation and perform better in climate protection (e.g., Bernauer & Koubi, 2009; Böhmelt et al., 2015; Bueno de Mesquita et al., 2003, pp. 54f.). The larger the winning coalition, the more the government provides public goods to stay in power (Bueno De Mesquita et al., 2003, pp. 101, 104). Presidential systems presumably have a larger winning coalition, as governments need the support of more than 50% of the selectorate to be elected (Bueno de Mesquita et al., 2003, p. 54). Böhmelt et al. (2015, pp. 100f.) add that having fewer effective parties than presidential systems with plurality voting makes it more likely that the government will provide environmental public goods (Chhibber & Nooruddin, 2004, pp. 161ff.; Persson & Tabellini, 1999). Finally, Dolšak (2001, p. 419) assumes that the centralisation of accountability in parliamentary systems (Weaver & Rockman, 1993, p. 15f.) hinders the adoption of unpopular climate policies. To conclude, the relationship between presidentialism and climate commitment and performance is theoretically unclear (see also Bernauer & Koubi, 2009, p. 1360; Dolšak, 2001, p. 419).

As previously explained, federalism is a redundant veto point, in relation to **bicameralism**. In additional, data availability issues make it impossible for this empirical study analyse bicameralism. Veto player theory suggests that bicameralism and federalism undermine the ratification of environmental and climate treaties and the adoption and implementation of environmental and climate-protection policies (e.g., Dolšak, 2001, p. 420; Harrison, 2007, pp. 96f.; Jahn & Wälti, 2007, p. 264; Steuer & Clar, 2015, p. 88; see also Hudson, 2012). Bicameral and federal systems imply an additional veto player, able to impede environmental or climate policy (Dolšak, 2001, p. 401; Harrison, 2007, pp. 96f.). Opponents of environmental protection at the regional level can block environmental reform (Dolšak, 2001, p. 420; Wälti, 2004, p. 605). They also make it difficult to respond quickly to global

[41] The first chamber of the legislature is not considered, as it exists in most democracies.

warming (Jahn & Wälti, 2007, p. 3). Further arguments suggest that federal systems, in particular, undermine climate commitment and performance. While climate change mitigation occurs mainly at the local level, only the future generation will benefit from climate protection. Federal states often have little interest in solving national or global environmental problems (Jahn & Wälti, 2007, p. 264) that depend on national or international responses (Wälti, 2004, p. 602). Christoff and Eckersley (2011, p. 441) argue that federalism especially hinders the adoption of climate policies when industries that expect to be negatively impacted by climate protection (e.g., the fossil-fuel industry) are concentrated in specific states or regions. With regard to climate performance, federalism may lead, via the decentralisation of responsibilities, to coordination problems and incoherent and inefficient climate policies (Clar et al., 2013, p. 4; Galarraga et al. 2011, p. 165; Goulder & Stavins, 2010; Kloepfer, 2004, p. 761; Poloni-Staudinger, 2008, p. 412; Scruggs, 1999, p. 10; Steuer & Clar, 2015, p. 88). Unitary states are likely to be more effective at solving environmental problems that result from spill-over effects (Wälti, 2004, p. 603). Additionally, economic competition among federal states can lead to a race-to-the-bottom (Wälti, 2004, p. 603). However, bicameralism and federalism may also contribute to climate commitment and performance. More veto players also imply that ENGOs and citizens have more opportunities to influence political decisions (Fiorino, 2011, p. 380; Kincaid, 2001, p. 88; Poloni-Staudinger, 2008, p. 414; Wälti, 2004, pp. 605f.; Ward, 2008, p. 406). They also facilitate the monitoring of environmental regulation implementation by ENGOs (Fiorino, 2011, p. 380). Thus, bicameral or federal states may be better able to represent generalised interests and to reduce the influence of special-interest groups (Fiorino, 2011, p. 381; Milner, 1993, p. 347; Rechia, 2002, pp. 474f.). As the consequences of global warming are felt at the local level, it cannot be assumed that federal states in general have no interest in climate change mitigation. Federal states may be more responsive to local demands to protect the environment (Fiorino, 2011, p. 380; Galarraga et al., 2011, p. 181; Kincaid, 2001, p. 88) and citizens of federal states may be more willing to accept the costs of environmental quality (Steurer & Clar, 2015, p. 89; Wälti, 2004, pp. 603f.). Federal states may perform better in climate performance because they are better at understanding regional differences (Kincaid, 2001, p. 88). Instead of a race-to-the-bottom, federalism may lead, via experimentation and the diffusion of environmental policies, to a race-to-the-top (e.g., Chappell, 2001, p. 61; Christoff & Eckersley; 2011, p. 441; Kincaid, 2001, p. 88; Poloni-Staudinger, 2008, pp. 413f.).

In sum, bicameralism and federalism have both positive and negative effects on climate protection. The total effect depends on whether supporters or opponents of climate protection are in power in both chambers of the legislative, as well as the vertical distribution of climate-policy responsibilities and resources (Chappell, 2001, p. 60; Christoff & Eckersely, 2011, p. 441; Pierson, 1995, p. 463). While the Canadian provinces were unable to block Kyoto Protocol ratification, they can undermine national efforts to reduce climate emissions because they are responsible for natural-resource extraction (e.g., oil, coal, gas) (Christoff & Eckersley, 2011, p. 441; Harrison, 2007, p. 97). By contrast, the federal system enables California to mitigate climate change, despite receiving little support from the federal government.

To conclude, the existing literature has either adopted a holistic approach and discussed the effect of institutional constraints or focused on the effect of specific political institutions. There is no agreement, either on the direction of the effect of the number of veto points, or on the direction of the effect of specific veto points on climate commitment and performance. Alongside ideological heterogeneity among veto players, this study investigates separately the effects of specific veto points.

4.2.3 Empirical research

While much of the empirical literature examines the effect of veto players on environmental policy, few studies have investigated climate commitment and performance specifically (see also Madden, 2014, p. 571). In particular, this is scant research on the ideological heterogeneity of veto players and climate commitment. In accordance with the theoretical debate, empirical research has investigated specific political institutions, as well as institutional constraints in general.

The existing literature on institutional constraints and climate commitment consists mainly of case studies, which focus on the ratification of the Kyoto Protocol by developed countries. They suggest that institutional constraints undermined Kyoto Protocol ratification. The separation of powers in the US suggests that opponents of climate change need the support of just one institution (Harrison, 2010, p. 76). Case studies show that the effect of concentration of power depends on its interaction with the policy preferences of political decision-makers (Harrison & Sundstrom, 2010b, p. 273; Harrison & Sundstrom, 2007, pp. 9f.). In political systems with few veto players (e.g., Canada, Russia), the policy preferences of political decision-makers were decisive for Kyoto Protocol ratification (Harrison & Sundstrom, 2010b, p. 273; Harrison & Sundstrom, 2007, pp. 9f.). demonstrated by Harrison (2007). Canada and the US accepted comparable greenhouse gas emissions targets during the negotiations (Harrison, 2007, p. 92). Both the Clinton administration and the government of the liberal Jean Chrétien in Canada supported the Kyoto Protocol (Harrison, 2007, pp. 95f.). However, Bill Clinton was unable to ratify the climate treaty because the US Congress had veto power (Harrison, 2007, pp. 95ff.). Similarly, Sussman (2004, p. 365) concludes from his case analysis of US global environmental policy that US efforts to protect the environment

have been constrained by the divergent partisanship of Congress and the President, alongside the influence of powerful business and industry interest groups. The Canadian provinces opposed to the Kyoto Protocol were unable to hinder ratification by the majority in parliament. Simultaneously, the concentration of authority enabled the later Canadian Prime Minster, Stephen Harper, to stop state efforts to mitigate climate change (Harrison & Sundstrom, 2007, pp. 9f.). Finally, the centralisation of power enabled the Russian president to ratify the Kyoto Protocol and realise his economic and foreign-policy preferences (Henry & Sundstrom, 2010, p. 107).

Political institutions appear to interact with electoral rules and incentives. Harrison and Sundstrom (2007, p. 10) have found, through case studies, that more veto players imply more opportunities for environmental and industry interest groups to influence climate commitment and performance. Weak party discipline in the US Congress makes members of the Senate more open to the influence of local business interests (Harrison, 2010, pp. 68, 69, 77; Harrison & Sundstrom, 2007, p. 10). Accordingly, Republican and Democratic senators opposed treaty ratification because of labour interests (Harrison, 2010, p. 69). Harrison (2010, p. 67) concludes that the lack of electoral incentives, together with institutional constraints, resulted in the non-ratification of the Kyoto Protocol in the US. Business strongly opposed climate cooperation and climate change mitigation efforts and funded right-wing think tanks that questioned climate change (Harrison, 2010, pp. 67, 69f.). In contrast to the European public, US citizens were less supportive of the leadership principle of the Convention (Harrison, 2010, p. 71). Public support was, therefore, not strong enough to limit the influence of business opposition to Kyoto Protocol ratification (Harrison, 2010, p. 67). In Canada, public support for climate cooperation was low; fossil-fuel intensive companies also opposed the ratification of the Kyoto Protocol (Harrison, 2007, pp. 94f., 112). A unilateral ratification by Canada implied that its businesses would be less competitive than their US counterparts within NAFTA (Harrison, 2007, p. 92). The low number of veto players, however, enabled the government to ratify the Kyoto Protocol. Fredriksson and Ujhelyi (2006, pp. 4f.) have found, through their survival analysis of Kyoto Protocol ratification, support for the hypothesis that the number of veto players measured via bicameralism and by the checks-and-balances indicator from the World Bank Database of Political Institutions, weakens the positive effect of ENGOs on ratification. The checks-and-balances indicator cannot be described as a valid indicator of veto points (see Chapter 6).

Steurer and Clar (2015, p. 99) have argued that federalism has been an obstacle for greenhouse gas emissions reductions in the Austrian building sector because the national government had to coordinate, not just various national ministries, but also provincial policies. In accordance with the conclusions of the theoretical discussion, Harrison and Sundstrom (2007 p. 10) have argued, based on case studies, that federalism has influenced Kyoto Protocol ratification in various ways, 'depending on the particular division of powers, the regional distribution of costs, and electoral incentives'. The Canadian federal government was able to ratify the Kyoto Protocol despite opposition from provinces that depended on the fossil-intensive industries because they had no power to veto the treaty ratification (Harrison, 2007).

Dolšak (2001) argues in his cross-sectional analysis that parliamentary systems are more likely than presidential systems to commit to climate cooperation. However, his summary measure of climate commitment also considers climate change mitigation[42]. Previous quantitative analyses have not taken into account the fact that veto players vary between domestic policy and international treaty ratification; instead, they have used indicators developed to explain domestic policy output. Table 4.3 summarises the previous quantitative research.

Quantitative studies have examined the effect of the number and ideological heterogeneity of veto players on climate performance (see Table 4.4, e.g., Fuchs et al., 2009; Jahn, 2008; Madden, 2014). Climate performance is measured using climate policy outputs (e.g., Madden, 2014) or outcomes (mainly CO_2 emissions) (e.g., Fuchs et al., 2009; Jahn, 2008; Jensen & Spoon, 2011). Madden (2014) has examined the adoption of climate policies and reforms. Jensen and Spoon (2011) have measured a country's compliance with its greenhouse gas emissions targets. While most pooled time-series analyses have focused on short-term changes in the dependent variable, Fuchs et al. (2009) have studied short- and long-term changes. Most studies have focused on OECD countries (e.g., Jahn,

[42] He uses an ordinal measure to indicate whether a country has signed or ratified the UNFCCC, submitted a national plan to the UNFCCC Secretariat, publicly announced an intention to mitigate climate change, and implemented climate change mitigation policies (Dolšak, 2001, pp. 421f.).

Table 4.3 Quantitative research on veto players and climate commitment

Study	Dependent variable	Measurement of veto players	Effect
Dolšak, 2001	Ordinal variable taking into account signature and ratification behaviour, international aid, national communications, Rio emissions target, enactment of carbon taxes	Parliamentary democracy	+
Fredriksson & Ujhelyi, 2006	Ratification of the KP	Number of veto players	The number of veto players decreases the positive effect of ENGO strength

Notes: + positive effect, / no effect, - negative effect on climate commitment. KP = Kyoto Protocol.

2008; Jensen & Spoon, 2011; Madden, 2014). This has enabled them to measure the ideological heterogeneity of veto players in the left/right and green/growth dimensions, using data from the Party Manifesto Project. Madden (2014, p. 578) has applied an additive veto-player index, which counts the number of institutional and partisan veto players (Madden, 2014, p. 578). He considers federalism, bicameralism, the president, plurality voting rules, referenda, constitutional courts, and plural interest-group systems. Jensen and Spoon (2011) have examined government parties and the president. Based on the assumption that the number and ideological heterogeneity of veto players moderates the effect of the policy preferences of government parties on climate policy, Jahn (2008) has measured the policy preferences of government parties, examining the number and ideological heterogeneity of veto players. Studies that consider countries outside the OECD have used the political constraints measure developed by Henisz (2002) or the checks-and-balances measure derived from the database of political institutions (DPI) (Cruz et al., 2016) (e.g., Fuchs et al., 2009; Tobin, 2017; Wurster, 2013). Neither measure can be regarded as a valid or reliable indicator of the ideological heterogeneity of veto players or the number of veto points (see Chapter 6).

Jensen and Spoon (2011, p. 109) have argued that the more divergent the ideological positions of veto players in relation to the environment, the higher the divergence between greenhouse gas emissions and greenhouse gas emissions targets. By contrast, the ideological range of veto players in the left/right dimension does not influence compliance with the Kyoto Protocol (Jensen & Spoon, 2011, p. 110). Madden (2014, pp. 580f.) has shown that the number of veto players decreases the number of climate policies and major climate-policy reforms. However, climate policies that distribute costs equally among many actors are more likely to be adopted by countries with many veto players than concentrated-cost climate policies (Madden, 2014, pp. 575f., 580f.). Tobin (2017) concludes that the lower the political constraints measure (Henisz, 2002), the more ambitious the climate policies. By contrast, Fuchs et al. (2009) have observed, using the same indicator, that institutional constraints reduce CO_2 emissions only outside the OECD. Wurster (2013) has found no significant effects of the separation of power, measured using the checks-and-balances indicator (Cruz et al., 2016), on CO_2 emissions in his worldwide analysis. Several studies have focused on the influence of specific political institutions on climate change mitigation. Garmann's (2014) analysis of changes in CO_2 emissions per unit GDP in 20 OECD countries shows that government fragmentation and coalition governments are associated with lower CO_2 emissions reductions. The effect of a coalition government is stronger than the effect of the number of government parties. Wurster (2013) observes no effect of the type of democracy (parliamentary, semi-presidential, or presidential democracy) on CO_2 emissions in his time-series analysis of 130 countries. He also finds no significant effect of decentralisation, measured using data from the Database of Political Institutions.

In accordance with theoretical considerations, qualitative research has shown that the effect of federalism depends on the responsibilities of federal states, as well as the importance of natural-resource extraction and pollution-intensive pollution in federal states. Harrison (2007, p. 114) has shown that, independent of their ratification behaviour, Canada and the United States both have ineffective climate policies. He argues that opposition to climate

change mitigation may be stronger than opposition to commitment (Harrison, 2007, p. 114). Moreover, the Canadian provinces have more opportunities to block the implementation of climate policies (Harrison, 2007, p. 114) because they own and control natural resources (Harrison & Sundstrom, 2007, p. 10). Several provinces depend on the fossil-fuel and automobile industries (Alberta, Ontario); they have therefore blocked federal efforts to reduce emissions (Harrison & Sundstrom, 2007, pp. 10f.) Federalism in Canada has been described as 'an obstacle to adoption of climate policies' (Harrison & Sundstrom, 2007, p. 10). In the US, federalism has enabled states such as California and New York to take the lead on climate change mitigation (Harrison, 2010, p. 68; Harrison & Sundstrom, 2007, p. 10). They do not depend on the fossil-fuel industry and have relatively low emissions (Harrison & Sundstrom, 2007, p. 10). In Australia, federal states are responsible for environmental policy (Crowley, 2007, p. 125). Crowley (2007, p. 125) argues that they have little interest in climate protection, as they depend on natural-resource exploitation (e.g. coal extraction). She notes that the federal government can achieve climate change mitigation by pressuring them through a tax-redistribution policy (Crowley, 2007, p. 125).

Table 4.4 Quantitative research on veto players and climate performance

Study	Dependent variable	Measurement of veto players	Effect
Jahn, 2008	CO_2 emissions change (annual), total, industry and traffic	Green government ideology corrected for the number of veto players	/
		Left/ right government ideology corrected for the number of veto players	+
Jensen & Spoon, 2011	Compliance with green house gas emissions targets	Ideological heterogeneity among government parties and the president on environmental issues	-
		Ideological heterogeneity among government parties and the president on the left/right dimension	/
Fuchs et al., 2009	CO_2 emissions CO_2 emission changes	Political constraints index from Henisz (2002)	+ in Non OECD-countries
Wurster, 2013	CO_2 emissions	Types of democracy	/
		Checks and balances	/
		Decentralisation	/
		Monarchic dictatorship	-
		Military dictatorship	/
		Civil dictatorship	/
Garmann, 2014	CO_2 emissions change per unit GDP	Governmental fragmentation	-
		Minority/ majority government	/
Madden, 2014	Adoption of climate policies	Number of veto players	-
		Ideological polarisation of government parties	-

Notes: + positive effect, / no effect, - negative effect on climate performance.

In sum, institutional constraints influence climate commitment. However, their effect depends on the policy preferences of the political authorities and on electoral incentives. Studies have reached different conclusions on whether the number of veto points matters to climate performance; there are no uniform effects of specific veto players. It is therefore important to study the effect of specific institutional constraints (see also Madden, 2014, p. 584). Empirical research that has found effects of veto points suggests that they undermine climate performance. The ideological heterogeneity of veto players in the left/right dimension does not influence climate performance, but polarisation in the green/growth dimension undermines efforts to reduce global air pollution (see also Jensen & Spoon, 2011, p. 110). Most studies have focused on developed countries.

4.2.4 Conclusions

Both the ratification of international climate agreements and the adoption and implementation of climate policies depend on a political process that is structured by the political institutionalist context. Based on the literature review, this section formulates hypotheses on the effect of specific veto points and ideological heterogeneity among veto players on climate commitment and performance (see Table 4.5).

In examining democracies and non-democracies, this study must address the transfer of the veto-player approach to autocracies. Veto player theory is not restricted to democracies (Cao & Prakash, 2012, p. 69; Tsebelis, 2002, p. 78). The number of non-democratic veto players, not based on democratic principles, varies across autocracies (Tsebelis, 2002, p. 78). Nonetheless, the veto-player approach has been developed in the context of established developed democracies. This study, therefore, focuses on democratic veto players. Domestic political institutional constraints in autocracies are not regarded as potential veto points (see also Hensiz, 2002). This empirical analysis considers democracy as a condition of the effect of specific veto points and ideological distance among veto players (see Chapter 6). The multivariate analysis controls institutional differences among autocracies (see Chapter 6). Data availability limits this analysis of the effect of veto-player influence on the left/right dimension[43]. In developed countries, the green/growth dimension is not examined, as there is little variation on the measures discussed here, during the research period in question. Tsebelis (2010, p. 5; Tsebelis, 1999, p. 595) has argued that, in a one-dimensional policy space, only the distance between the two most extreme veto players represents a decisive policy change. With regard to the effect of ideological heterogeneity on climate commitment, only the veto player who disagrees the most with the international treaty is crucial (Schulze, 2014, p. 119). On the left/right dimension, right-wing ideology is less in favour of international cooperation. Thus, a right-wing veto player is likely to reduce a country's commitment to the climate cooperation.

The presence of a right-wing veto player is unlikely to affect the ratification of the UNFCCC, which incurs few costs in developed and developing countries. In the absence of any right-wing government ideology, the ratification of hard climate treaties, such as the Kyoto Protocol, generally depends on their legal implications (e.g., greenhouse gas emissions target), especially in developed countries.

Table 4.5 Veto players and climate commitment and performance

	UNFCCC		**Kyoto Protocol**		**Climate Performance**	
	Pooled analysis *Developing countries*		Pooled analysis *Developing countries*		Developed countries *Developing countries*	
Right veto player/ Ideological heterogeneity*	$H_{Veto}1.1.1$	/	$H_{Veto}1.2.1$	-	$H_{Veto}1.3.1$	/
	$H_{Veto}1.1.2$	/	*$H_{Veto}1.2.2$*	-	*$H_{Veto}1.3.2$*	/
Government fragmentation	$H_{Veto}2.1.1$	/	$H_{Veto}2.2.1$	-	$H_{Veto}2.3.1$	-
	$H_{Veto}2.1.2$	/	*$H_{Veto}2.2.2$*	-	*$H_{Veto}2.3.2$*	-
Presidentialism	$H_{Veto}3.1.1$	/	$H_{Veto}3.2.1$	/	$H_{Veto}3.3.1$	/
	$H_{Veto}3.1.2$	/	*$H_{Veto}3.2.2$*	/	*$H_{Veto}3.3.2$*	/
Bicameralism	$H_{Veto}4.1.1$	/	$H_{Veto}4.2.1$	/	$H_{Veto}4.3.1$	/
	$H_{Veto}4.1.2$	/	*$H_{Veto}4.2.2$*	/	*$H_{Veto}4.3.2$*	/

Notes: + positive effect, / no effect, - negative effect on climate commitment, +/- direction unclear. * Climate commitment: presence of a right veto player. Climate performance: ideological heterogeneity on the left/right dimension among veto players.

Ideological heterogeneity in the left/right dimensions is unlikely to affect climate performance.[44] Based on previous empirical findings, this study assumes that government fragmentation undermines climate commitment and performance. As discussed above, this does not apply to the soft UNFCCC. The effect of presidentialism is theoretically ambiguous; there has been little empirical research with regard to climate commitment and performance. Overall, no independent effect of bicameralism/federalism is expected. The effect depends on who is in power and the distribution of political responsibility and financial resources between the federal and state levels.

[43] Jensen and Spoon (2011, pp. 113; footnote) have found that government positions in the left/right and green/growth dimensions are highly correlated; for this reason, they have not tested their effects simultaneously (see also Jahn, 2016a, p. 174).

[44] On the green/growth dimension, green parties are more likely to ratify international climate treaties than other parties, given that green parties support international cooperation and climate protection.

4.3 Political corruption and climate commitment and performance

Economists and political scientists study the importance of political corruption on climate output and outcome. This chapter addresses the conceptualisation of corruption (4.3.1). It discusses the theoretical and empirical literature (4.3.2 & 4.3.3) and formulates hypotheses on the relationship between political corruption and climate commitment and performance (4.3.4).

4.3.1 Conceptualisation of political corruption

There are multiple concepts of political corruption. Public understandings of corruption are not suitable for scientific analysis, as they are emotional-laden and have a moral component (Pellegrini, 2011, p. 14). Legal definitions vary across countries (Pellegrini, 2011, pp. 15f.). In economics and political science, corruption is commonly defined as 'the misuse of public office for private gain' (Treisman, 2000, p. 399; see also Knack, 2006, p. 5; Kurer, 2005, p. 234; McMann et al., 2016, p. 8; Rothstein & Teorell, 2008, p. 170; Treisman, 2007, p. 211). Corruption is limited to political or public sector corruption. Private-sector corruption is often neglected (Pellegrini, 2011, p. 14). While corruption in the business sector does affect climate performance, the focus here is on political and public sector corruption, highlighting the interrelationship between domestic political institutional factors and globalisation. 'Misuse' is often limited to illegal actions (Knack, 2006, p. 5).[45] Pellegrini (2011, p. 17) notes that the misuse of public office is a universal norm shared by most cultures. Many definitions do not further specify the type of misuse (Pellegrini, 2011, p. 16). Rothstein and Teorell (2008, p. 170) have defined political corruption, following Kurer (2005), as the misuse of public office for private gain, which violates impartiality in the exercise of public authority. Treisman (2000, p. 211) notes that:

'[t]he quintessential corrupt transaction envisioned is the gift of a bribe by a private citizen to a public official in return for some service that the official should either provide for free (e.g., registering a firm) or not provide at all (e.g., inside information).'

McMann et al. (2016, p. 8) define corruption as 'bribes, undocumented extra payments, kickbacks, contracts for personal gain, future employment, theft, embezzlement, and misappropriation' (see also Nye, 1967, p. 419; Pellegrini. 2011, p. 17).

Wilson and Damania (2005, p. 518) have argued that different forms of political corruption should be distinguished in analyses of the environment. They distinguish between grand and petty corruption (Wilson & Damania, 2005, p. 517). This classification system categorises political corruption by political level (Knack, 2006, p. 5). Grand corruption refers to payments made directly to political decision-makers in the political decision-making process (Wilson & Damania, 2005, p. 517) and to high-level bureaucrats (Rose-Ackermann, 1999, p. 11). Petty corruption involves payments made to bureaucrats to avoid sanctions under existing law (Wilson & Damania, 2005, p. 517). Accordingly, Pellegrini (2011, p. 19) distinguishes between political and bureaucratic corruption; McMann et al. (2016) focus on executive, legislative, judicial, and public sector corruption. The present study examines the effect of executive, legislative, and public sector corruption as these dimensions overlap with the distinction between political and bureaucratic corruption.

In sum, the academic literature focuses on the analysis of political corruption, defined as the misuse of public office by political decision-makers and public-sector officials for private gain in relation to climate policy. Scholars have proposed distinguishing between corruption in political decision-makers and public officials.

4.3.2 Review of the theoretical literature

Most scholars assume that political corruption undermines environmental performance (López & Mitra, 2000, pp. 138f.). The direct and indirect negative effects of political corruption on environmental protection policy adoption and implementation have been examined (e.g., Cole, 2007, pp. 637f., 640; Damania et al., 2003, p. 492; Welsch, 2004, p. 664). Political corruption affects climate commitment and performance directly, as governments accept bribes in exchange for not adopting or implementing environmental regulations. Public-sector officials can be pressured to avoid monitoring the behaviour of firms or implementing environmental regulations (Holmberg et al., 2009, p. 152; Miller, 2011, p. 51; Robbins, 2000, p. 430; Smith & Walpole, 2005, pp. 251f.; Wilson & Damania, 2003, p. 516). Thus, political corruption provides an incentive for non-state actors to bribe political decision-makers and bureaucrats (Povitkina, 2018, p. 415). In contrast to ENGOs (Fredriksson et al., 2007, p. 234), industry lobby groups appear better organised and have more financial resources at their disposal. They use these to persuade politicians and bureaucrats to refuse to ratify climate treaties or reduce greenhouse gas emissions (Hahn, 1990, p. 23; Halkos, et al. 2015, pp. 624f.). Second, corrupt governments are less responsive to environmental protection demands and less willing to adopt stricter environmental regulations (Damania et al., 2003, p. 493; Wilson & Damiana 2005, p. 529). Political corruption moves economic resources from public-good provision to

[45] The concept of corruption may not apply political-transition situations (Pellegrini, 2011, p. 18).

private consumption (Morse, 2006). Accordingly, it creates incentives for public-sector officials to refuse to undermine the implementation of climate policies (Damania 2002, p. 410; Povitikina, 2018, p. 415). Third, the long-term experience of public sector corruption may make the adoption and implementation of climate-protection policies unlikely, as political decision-makers expect corrupt behaviour to undermine their efforts in the long term. (Dahlström et al., 2013, pp. 523ff.; Fredriksson & Neumayer, 2016, p. 454). At the same time, polluters do not comply with environmental regulations because political corruption reduces their trust in political institutions to implement and enforce them (Povitkina, 2018, p. 415; Rothstein & Eek, 2009, p. 82f.).

Political corruption also affects climate performance indirectly, via its impact on economic development, defined as GDP per capita (Cole, 2007, pp. 637f.; Holmberg et al., 2009, p. 152; Welsch, 2004, p. 664).[46] Economists assume that government quality contributes to economic growth (e.g., Kaufmann et al., 1999). Institutional quality is a condition for large domestic and foreign investments in natural-resource extraction and production (Duit, 2014, p. 14). This implies that political corruption contributes to climate performance by lowering the scale effects on pollution. Welsch (2004, p. 664) supports EKC theory in arguing that the indirect effect of corruption depends on the level of economic development. López and Mitra (2000, pp. 149f.; see also Leitão, 2010) assume that corrupt governments do not adopt stricter environmental regulations, in accordance with business interests. Political corruption in developing countries shifts the EKC turning point to a higher per capita income level (López & Mitra, 2000, pp. 149f.). Particularly in developing countries, political corruption undermines climate-protection efforts. Finally, political corruption reduces the financial resources a government needs to address climate change (Povitkina, 2018, p. 412; Tanzi & Davoodi 1998, p. 51).

The literature discusses the extent to which political corruption interacts with other variables, including political stability (Fredriksson & Svensson, 2003), democracy (Pellegrini & Gerlagh, 2006, p. 332; Povitikina, 2018), political competition (Wilson & Damania, 2005), and economic globalisation (see Chapter 3).

To conclude, most theoretical arguments suggest that corruption among political decision-makers and public officials undermines climate commitment and performance (see also Cole, 2007, p. 639; Halkos et al., 2015, p. 622). This applies in particular to developing countries (Damania, 2002, p. 407; Desai, 1998b, p. 299f.; López & Mitra, 2000; Welsch, 2004, pp. 663ff.). Developing countries are characterised by low levels of government effectiveness, weak governments, and corruption. The negative effect of corruption is more pronounced in relation to climate performance, rather than commitment, as emissions are influenced by public sector corruption and the government's ability to implement environment regulations (Welsch, 2004, p. 665). However, political corruption also contributes to climate performance through the lower scale effects of economic growth.

4.3.3 Empirical research

There is little quantitative research on the impact of political corruption on climate commitment (see Table 4.6). Fredriksson et al. (2007) have examined the effect of political corruption and interest-group influence on Kyoto Protocol ratification, using the stratified hazard model, in 170 countries. Political corruption increases the positive influence of ENGOs on a country's climate commitment. Most statistical studies have examined the relationship between corruption and climate performance in developed and developing countries using time-series cross-sectional regression (see Table 4.7, e.g., Biswas et al., 2012; Cole, 2007; Holmberg et al., 2009) or cross-sectional regression (Chang, 2015; Fredriksson & Neumayer, 2016). Climate performance is measured by CO_2 emissions. Fredriksson and Neumayer (2016) have examined climate-policy stringency via the CLIMI index, which combines indicators of climate commitment and performance (see Chapter 2). Political corruption is captured using corruption data from the Corruption Perceptions Index (CPI) developed by Transparency International (e.g., Biswas et al., 2012; Fredriksson & Neumayer, 2016) and/or the International Country Risk Guide (ICRG) (e.g., Biswas et al., 2012; Cole, 2007; Fredriksson & Neumayer, 2016). Both measures have validity and reliability problems (see Chapter 6). Povitkina (2018) has applied the political corruption index developed by McMann et al. (2016). Previous quantitative research has not distinguished between corruption among political decision-makers and public officials.

[46]Some scholars regard corruption as endogenous to economic growth (Goldsmith, 2007, p. 165; Holmberg et al., 2009, p. 140).

Table 4.6 Quantitative research on political corruption and climate commitment

Study	Dependent variable/s	Measurement of political corruption	Effect
Fredriksson et al., 2007	KP ratification	CPI, WGI corruption measure	Government corruption increases the positive effect of ENGO influence.

Notes: KP = Kyoto Protocol, CPI = Corruption Perception Index from Transparency International, WGI = World Governance Indicators.

Most studies support the theoretical expectation that corruption undermines climate performance (e.g., Biswas et al., 2012; Cole, 2007; Fredriksson & Neumayer, 2016; Holmberg et al., 2009). Holmberg et al. (2009) have shown that corruption control correlates positively with global air pollution, concluding that 'the less local a particular type of pollution is and the more externalities it has, the less likely governments are to tackle pollution' (Holmberg et al., 2009, p. 154). Fredriksson and Neumayer (2016) have demonstrated that, while the current level of corruption is not decisive, the historical experience is relevant to climate-policy stringency. This finding raises questions about the analysis of the short-term effects of political corruption. Cole (2007) has observed that political corruption has a negative effect on CO_2 emissions, which becomes weaker with GDP per capita and positive for high levels of GDP per capita. This finding offers some support for the argument that the effect of political corruption varies between developed and developing countries. In developing countries, political corruption is associated with lower levels of global air pollution via scale effects of economic growth. Finally, quantitative research indicates that corruption moderates the effects of shadow-economy size (Biswas et al., 2012) and democracy on CO_2 emissions (Povitkina, 2018).

To conclude, most statistical studies support the argument that political corruption undermines climate performance. There is little research on the importance of political corruption for climate commitment. Political corruption among political decision-makers and public sector corruption are not distinguished in previous studies.

Table 4.7 Quantitative research on political corruption and climate performance

Study	Dependent variable/s	Measurement of political corruption	Effect
Cole, 2007	CO_2 emissions	ICRG corruption measure, WGI corruption measure	- -
Holmberg et al., 2009	CO_2 emissions	CPI	+
Biswas et al., 2012	CO_2 emissions per capita	ICRG corruption measure WGI corruption measure	Corruption strengthens the negative effect of the size of the shadow economy
Fredriksson & Neumayer, 2016	Stringency of climate policies (CLIMI)	Historical experience with corruption control	-
Povitkina, 2018	CO_2 emissions per capita	V-Dem political corruption index	-

Notes: + positive effect, - negative effect on climate performance, CPI = Corruption Perception Index from Transparency International, WGI = World Governance Indicators.

4.3.4 Conclusions

The literature suggests that political corruption undermines climate commitment and performance, both directly and via economic development. The theoretical literature distinguishes between the corruption of political decision-makers and public sector corruption. The latter has no direct effect on the ratification of international agreements. Previous empirical analyses have not differentiated between dimensions of political corruption.

The data provided by V-Dem and McMann et al. (2016) make it possible to distinguish between executive, legislative, and public sector corruption. The negative effects of executive, legislative, and public sector corruption (see Table 4.8) apply especially to developing countries. Political corruption has more impact on climate performance than on commitment. The former is not only influenced by corruption among political decision-makers, but also by public sector corruption.

Table 4.8 Political corruption and climate commitment and performance

	UNFCCC		**Kyoto Protocol**		**Climate Performance**	
	Global analysis *Developing countries*		Global analysis *Developing countries*		Developed countries *Developing countries*	
Executive Corruption	$H_{Corr}1.1.1$	/	$H_{Corr}1.2.1$	-	$H_{Corr}1.3.1$	-
	$H_{Corr}1.1.2$	*/*	*$H_{Corr}1.2.2$*	-	*$H_{Corr}1.3.2$*	-
Legislative Corruption	$H_{Corr}2.1.1$	/	$H_{Corr}2.2.1$	-	$H_{Corr}2.3.1$	-
	$H_{Corr}2.1.2$	*/*	*$H_{Corr}2.2.2$*	-	*$H_{Corr}2.3.2$*	-
Public Sector Corruption					$H_{Corr}3.1$	-
					$H_{Corr}3.2$	-

Notes: + positive effect, / no effect, - negative effect on climate commitment/ performance, +/- direction unclear.

There is likely to be no negative effect of political corruption on the ratification of soft climate treaties, such as the UNFCCC, which cost little to ratify. Corrupt governments and parliaments may ratify such treaties to enhance their international reputations. By contrast, the Kyoto Protocol has domestic consequences for developed countries (greenhouse gas emissions targets) as well as for developing countries (support of sustainable development and environmental protection by industrialised countries).

4.4 Regime type and climate commitment and performance[47]

The relationship between democracy and the global atmosphere has been addressed by both policymakers (Petherick, 2014) and scientists. Al Gore (1992, p. 179) wrote that 'the spread of democratic government to more nations of the world … [is] an essential prerequisite for saving the environment.' Academic work on democracy and global warming refers to an older debate on the environmental consequences of regime type, which began in the 1970s. The democracy/climate change literature refers to theoretical approaches drawn from comparative politics, international relations, political philosophy, and economics. Publications within the democracy/global-warming literature define democracy and autocracy in different ways. This chapter begins by discussing the conceptualisation of democracy in analyses of climate commitment and performance (4.4.1); on this basis, it examines the theoretical and empirical literature (4.4.2 & 4.4.3). The final section (4.4.4) summarises these conclusions. The developed-country sample used in this study consists of democracies (see Chapter 6). This section, therefore, formulates hypotheses related to the pooled analysis of the climate commitment of developed and developing countries, as well as the separate analysis of the climate performance of developing countries.

4.4.1 Conceptualisation of regime type

The term democracy comes from the Greek word *demokratia*, which consists of the words *demos*, i.e. people, and *kratein*, i.e. to rule (Held, 2006, p. 1). Accordingly, '[d]emocracy means a form of government in which […] the people rule' (Held, 2006, p. 1). Scholars disagree about what constitutes democracy, apart from (competitive) elections (Coppedge et al., 2011, pp. 248, 258; Geissel et al., 2016, p. 574; Merkel, 2016, p. 444). The literature encompasses various normative models of democracy (e.g., Held, 2006; Merkel, 2004). Most scholars distinguish between democracy understandings, with regard to the number of democracy attributes (e.g., Geissel et al., 2016; Merkel, 2004). Merkel (2016, pp. 457ff.) identifies minimalistic, procedural, and maximalist models of democracy. Minimalistic democracy concepts reduce democracy to competitive elections, i. e. participation and competition ('electoral accountability') (Merkel, 2016, p. 457). Maximalist democracy conceptions consider policy outputs and outcomes (e.g., economic equality), as additional attributes of democracy (Merkel, 2016, pp. 457f.). Merkel (2016, p. 458f.) locates procedural understandings of democracy between minimalist and maximalist conceptions of democracy. They exclude policy outputs and outcomes but include additional institutional elements of democracy, alongside participation and competition. Finally, empirical democracy research discusses whether

[47] Parts of this chapter have been used in Escher & Walter-Rogg (2020, 2018).

democracy is a continuous or binary variable (Munck & Verkuilen, 2002, pp. 17f.; Elkins, 2000; Wahman et al., 2013, p. 21).

This section argues that the choice of a democracy concept depends on the research question and hypotheses (see also Collier & Adcock, 1999; Wahman et al., 2013, p. 21). Minimalistic models of democracy distinguish electoral democracies from autocracies and make it possible to examine the effect of regime-type difference on climate commitment and performance (Cheibub et al., 2010, p. 73). Accordingly, Bernauer and Koubi (2009), Pellegrini and Gerlagh (2006), and Wurster (2013) apply a minimalist democracy concept. With regard to the ratification of the soft UNFCC, democracies seem more likely to join international climate cooperation (see the following section) (see also Coppedge et al., 2016, p. 584). To test this hypothesis, the present study applies a minimalist conception of democracy (see also Cheibub et al., 2010, p. 73, Wurster, 2013, p. 82). Accordingly, it conceptualises regime type as dichotomous when analysing UNFCCC ratification (see also Hadenius & Teorell, 2007, p. 145; Wurster; 2013, p. 82). In the statistical analysis, a more demanding democracy conception is also used to consider arguments that a country's experience with democracy is decisive.[48] As the following section will show, the democracy/environment literature debates the influence of multiple democracy-quality dimensions, apart from competitive elections, on climate commitment and performance. Minimalistic models of democracy do not allow a comprehensive evaluation of a country's democracy quality. They are, therefore, less useful for conceptualising and measuring the quality of specific institutional traits of democracy.

Multiple scholars who theorise the relationship between democracy and the environment have adopted, at least implicitly, a maximalist model of democracy. They emphasize economic development and market economy (e.g., Desai 1998a, p. 11; Midlarsky, 1998, p. 344; Neumayer, 2002a, p. 141; Payne, 1995, p. 48ff.), as well as international cooperation (e.g. Midlarsky, 1998, p. 344; Payne, 1995, p. 46), in examining environmental commitment and performance. A procedural understanding of democracy, as opposed to a maximalist understanding of democracy, enables us to analytically separate the effects of the quality of political democracy on climate commitment and performance from the effects of the association of democracy with international cooperation and economic development. The next chapter will address the joint effect of regime type and international political integration. Economic variables will be treated as controls in the empirical analysis.

Procedural models of democracy consider different aspects of democracy, as well as competitive elections (Coppedge et al., 2016, p. 581; Coppedge et al., 2011, pp. 248, 258; Geissel et al., 2016, p. 574; Merkel, 2016, p. 444). Scholars discuss whether electoral, liberal, deliberative, or participatory democracy is better for environmental protection. To systemise the literature, this study adopts the internal embeddedness dimension of Merkel's (2016; 2004) *embedded democracy* concept, from a liberal democracy understanding. This study examines climate commitment and performance at the national level. Green political theorists, who favour deliberative and participatory democracy, emphasize the importance of deliberation and the involvement of citizens at the local level. The embedded democracy concept assumes that the quality and stability of democracy depends on five interdependent democratic partial regimes: electoral and horizontal accountability, political and civil rights, the effective power to govern of democratically elected representatives (internal embeddedness), as well as their interdependence with several external conditions (external embeddedness) (Merkel, 2016, p. 460; Merkel, 2004, p. 36). Thus, it makes a comprehensive evaluation of democracy quality possible. Second, the distinction between internal and external embeddedness of democracy enables us to separate the theoretical work that links democracy or its quality to climate policy, via its association with international cooperation (e.g., Midlarsky, 1998, pp. 345f.; Payne, 1995, p. 46) and economic development (e.g., Burnell, 2012; Midlarsky, 1998; Neumayer, 2002a; Payne, 1995), from arguments that stress the procedural attributes of political democracy. Third, in comparison to democracy concepts that focus on political rights and civil liberties (e.g., Collier & Levitsky, 1997, p. 434; Freedom House, 2017, no page number), it identifies democracy-quality dimensions that are regarded as important in the democracy/environment literature: electoral accountability, horizontal accountability, political liberties, and civil liberties[49] (Escher & Walter-Rogg, 2018). Finally, it is still relatively parsimonious (e.g., Diamond & Morlino, 2005, p. Xii). In its analysis of democratic qualities – vertical and horizontal accountability, political and civil rights – and climate commitment and performance, this study regards democratic qualities as continuous concepts.

4.4.2 Review of the theoretical literature

Numerous publications within the democracy/environmental literature emphasize **vertical accountability**, i.e. the universal right to participate in free and fair elections of political authorities (Merkel, 2016, p. 261; Merkel, 2004, p. 42). First, scholars expect competitive elections to strengthen climate commitment and performance because

[48] The analysis of the importance of the policy preferences of veto players and veto points tests hypotheses developed during the analysis of established democracies; it therefore requires a more demanding democracy conception.

[49] I do not consider effective government to be a dimension of democracy quality. It is contested whether effective government is a trait of democracy (Geissel, et al., 2016, p. 575). Another study has shown that the effective power to govern has no effect on climate commitment and performance (Escher & Walter-Rogg, 2018).

the median voter prefers stricter environmental policies than do political and economic elites in autocracies (Congleton, 2002, p. 258; Congleton, 1992, p. 417; Barrett & Graddy, 2000, p. 434; Bernauer & Koubi, 2009, p. 1356). Democratic governments are more responsive to the climate-policy preferences of median voters than their autocratic counterparts, since they depend on re-election (Congleton, 1992, p. 413). In autocracies, political power lies in the hands of one or several rulers, who depend on the support of political and economic elites (Congleton, 1992, p. 413). As the autocratic ruling class controls a large part of the country's national income, it is likely to oppose the adoption of stricter environmental regulations (Bernauer & Koubi, 2009, p. 1356; Congleton, 1992, pp. 416f., 421). According to Barrett and Graddy (2000, p. 434), the higher the level of economic development (GDP per capita), the more citizens presumably strive for non-material goods, such as environmental quality.

Second, public goods theory suggests a positive relationship between electoral accountability and environmental protection (e.g., Bernauer & Koubi, 2009; Bueno De Mesquita et al., 2003). Bueno De Mesquita et al. (2003, pp. 8f., 10, 29, 51) assume that political decision-makers allocate tax revenues in the form of public and/or private goods to realise their policy preferences and stay in power. In contrast to private goods the number of persons that benefit from public goods such as climate protection cannot be limited (Bueno De Mesquita et al., 2003, pp. 30f., 58). The cost of public-goods provision falls, relative to the price of private goods, with the size of the selectorate, i.e. those who choose political leaders and the part of the selectorate that keeps political leaders in power (the winning coalition) (Cao & Ward, 2015, p. 265; Bueno De Mesquita et al., 2003, pp. 41f., 51). Size and membership of the selectorate and winning coalition vary across political systems (Bueno De Mesquita et al., 2003, pp. 42, 49). Free and fair elections imply that all adult citizens belong to the selectorate (Bueno De Mesquita et al., 2003, p. 49). As democracies have larger winning coalitions and selectorates than autocracies, democratic governments must provide more environmental public goods than private goods to stay in power (Bueno De Mesquita et al., 2003, p. 104; see also Pellegrini & Gerlagh, 2006, p. 334; Ward, 2008, p. 387; Wurster, 2013, p. 80).[50] In autocracies, political and economic elites have little interest in bearing the cost of environmental protection, while the whole population profits from it (Bernauer & Koubi, 2009, p. 1356).

Third, citizens in countries with competitive elections are more likely to consider environmental regulations than their autocratic counterparts, where government legitimacy depends on economic and social performance (Burnell, 2012, p. 823; Burnell, 2009, p. 6; Wurster, 2013, p. 79). Fourth, autocratic governments are assumed to have a short time horizon; they are probably less willing to accept risks, given that their rule is more uncertain (Congleton, 1992, pp. 417, 421). Hence, democracies are more likely to adopt long-term climate-protection policies (Congleton, 1992, p. 417). In addition, ecological sustainability is thought to depend on a stable political environment (Wurster, 2013, p. 79). Autocracies are considered less stable than democracies (Padró I Miquel, 2007, p. 1271; Wurster, 2007, p. 79). Electoral accountability also contributes to learning and the correction of errors (Wurster, 2013, p. 79). Payne (1995, p. 44) argues that elections enable green parties to gain political influence and to implement environmental policies. Finally, scholars have claimed that the positive effect of elections depends on competition (e.g., Fredriksson et al., 2005, p. 350; List & Sturm, 2006, p. 1259; Wilson & , 2005; Wurster, 2013, p. 79). Governments only consider citizens' climate-policy preferences when they are relevant to their re-election. It is questionable whether competitive elections contribute to climate commitment and performance. Apart from the hypothesis that competitive elections enable green parties to gain political influence, most theoretical arguments assume that citizens are environmentally friendly (Spilker, 2013, p. 78; Ward, 2008, p. 389). Survivalist theorists regard most citizens as lacking the knowledge to understand the importance of sustainable environmental policies (e.g., Ophuls, 1977, pp. 159f.). Inhabitants of low-income countries may prioritize economic development (Barrett & Graddy, 2000, p. 434; Neumayer, 2002a, p. 150; Spilker, 2013, 12f.). Burnell (2009, p. 5) notes that many citizens of high-income countries don't act in environmentally friendly ways (N-shaped relationship between economic development and pollution). Empirical research has found that climate concern varies among countries (e.g., Kim & Wolinsky-Nahmias, 2014). Lim and Duit (2018, p. 221) have argued that relatively few voters consider environmental performance in their individual votes. According to Midlarsky (2001, p. 159), writing about resource scarcity, democratic governments may prefer to address economic problems, rather than environmental pollution. Thus, democratically elected governments prefer to promote economic growth, tax revenues, and employment over environmental protection (Duit, 2014, p. 2). The salience of the climate issue is expected to increase as the climate problem grows more urgent (Hofrichter & Reif 1990, p. 120; Lim & Duit, 2018, p. 224; Rohrschneider, 1988).

The assumption that democracies provide more climate protection – because it is a public good and everyone profits – is also problematic. Public-good policies are always a mix of private and public-good allocation. According to Lafferty and Meadowcroft (1997, p. 5), 'in reality environmental problems touch different groups in different ways' (see also Bueno De Mesquita et al., 2003, p. 30).

Finally, characteristics of the climate change problem question the positive effects of vertical accountability. Democratic governments are accountable to citizens within the nation-state and may, therefore, be no more willing than

[50] A similar argument has been made by Lake and Baum (2001).

autocracies to deal with global environmental pollution (Fredriksson & Neumayer, 2013, p. 12; Held & Hervey, 2011, p. 90; Lafferty & Meadowcroft, 1997, p. 5; Midlarsky, 2001, p. 160; Midlarsky, 1998, p. 345; Paehlke, 1997, p. 28). The diffuse character of climate change makes emissions irrelevant to most citizens' election decisions. Democratically elected decision-makers may have a short-time horizon (Bernauer & Koubi, 2009, p. 1357; Underdal, 2010). Global warming mainly affects future generations and climate policies will only impact emissions in the long term; their effectiveness depends on the actions of other countries (Cao & Ward, 2015, p. 271; Wurster, 2013, p. 90). Autocracies may therefore find it easier to reduce greenhouse gas emissions (see also Bernauer & Koubi, 2009, p. 1357). The solution of the climate change problem is associated with considerable socio-economic opportunity costs and necessitates considerable changes in citizens' daily lives, and in the way economy works (Holden, 2002, p. 10). Democratic governments face citizens who are unwilling to accept the socio-economic costs of protecting the climate (Holden, 2002, p. 10) and who therefore prioritize economic development (Shearman & Wayne, 2007, pp. xivf., 83). Thus, democratically elected decision-makers may avoid supporting climate cooperation or implementing climate policies. Instead, they prioritize economic development and produce greenhouse gases, in order to be re-elected, despite the long-term consequences for the common-pool resource (Shearman & Wayne, 2007, pp. xivf., p. 83). Non-elected governments are not necessarily more willing to participate in international efforts to mitigate climate change. Their legitimacy also rests on socio-economic performance. Overall, an effect of vertical accountability on climate commitment and performance cannot be expected. Government behaviour depends on whether supporters or opponents of climate protection are elected.

Democratic decision-makers are not simply accountable to their citizens via periodic competitive elections, their autonomy is also limited by checks and balances. The theoretical discussion on **horizontal accountability** and climate commitment and performance overlaps with academic work on institutional constraints and the global atmosphere (see Section 4.2). Horizontal accountability, i.e. the separation of powers and interdependence between the legislative, executive, and judicial branches of government (Merkel, 2016, p. 462; Merkel, 2004, pp. 40f.; O'Donnell, 1994, p. 61) may make the government more responsive to climate protection demands; alternative policy choices are more likely to be discussed, while the public is informed about environmental policies and their implementation (Burnell, 2012, p. 823). At the same time, a single veto player opposed to climate protection can hinder the ratification of climate treaties and the adoption of policies to mitigate global warming. The environmentalist authoritarian literature maintains that fast action is needed to mitigate climate change; this is hindered by the democratic decision-making process (Gilley, 2012, p. 289; Fliegauf & Sanga, 2010, no page number). Democratic governments must reach agreement with veto players 'who see measures to mitigate global warming as detrimental to their short-term economic and/or political interests' (Fliegauf & Sanga, 2010, p. 2; see also Wurster, 2013, p. 79). In the case of a crisis such as climate change, autocratic governments find it easier to reach and implement political decisions (Beeson, 2010, p. 289; Fliegauf & Sanga, 2010, p. 1). Consequently, horizontal accountability may hinder climate-protection efforts. Overall, a uniform effect of checks and balances on climate commitment and performance cannot be expected.

The democracy/environmental literature also emphasises **political rights**, i.e. freedoms of expression, association, and the media, as well as the autonomy of civil society (Merkel, 2004, p. 39). These institutional traits enable citizens to inform themselves about pollution (Barrett & Graddy, 2000, p. 434; Bernauer et al., 2013; p. 93f.; Payne, 1995, p. 43), to express their environmental policy preferences (Bernauer et al., 2013, p. 93), to form ENGOs, to mobilise public support (Fredriksson & Neumayer, 2013, p. 12; Gleditsch & Sverdrup, 2002, p. 48), and to influence the government's decisions (Burnell, 2009, p. 6; Payne, 1995, p. 43). An independent civil society makes it more likely that citizens will express their policy preferences (Böhmelt et al., 2016, p. 1277). Free media enable citizens, journalists, and scientists to monitor government policy (Payne, 1995, p. 45) and support technological innovation and the spread of scientific knowledge (Gleditsch & Sverdrup, 2002, p. 47). Political rights can also impede climate change mitigation efforts. According to Olson (1982), democracy supports the influence of powerful special-interest groups around narrow interests; this can block environmental policy reforms (e.g., Bernauer & Koubi, 2009, p. 1357; Held & Hervey, 2011, p. 90; Midlarsky, 1998, p. 544; Never & Betz, 2014, p. 12; Payne, 1995, p. 43; Shearman & Wayne 2007, pp. 89, 91). Competition among interest groups can also affect the implementation of environmental regulations (Midlarsky, 1998, p. 344). It is important to acknowledge that ENGOs may mobilise support mainly to solve local and regional environmental problems. To conclude, political rights do not automatically lead to climate commitment and performance. However, they are the condition that ensures that diffuse interests, such as climate protection, are at least considered in the political decision-making process.

In the 1970s, green political theorists argued that **civil rights**, i.e. constitutional rights protecting the individual against the state (including the rule of law, protection of life and freedom, private property) (Merkel, 2016, p. 272; Merkel, 2004, pp. 39f.) helped individuals follow their own self-interest, versus the common interest of environmental protection (Hardin, 1968; Heilbroner, 1974; Ophuls, 1994; Ophuls, 1992; Ophuls, 1977, pp. 145ff.; Ophuls & Boyan, 1992). Citizens would not accept reductions in their standard of living (e.g., Heilbroner, 1974, p. 115, 137f.; Ophuls, 1977, pp. 152, 163). From this perspective, the environmental crisis can be regarded as a 'tragedy

of the commons' (Hardin, 1968, see also Doherty & Geus, 1996, p. 1), which can only be solved by reducing individual liberty (Heilbroner, 1974, pp. 137f.). Only autocracies are able to enforce the necessary restrictions on the individual use of scarce environmental resources (Ophuls, 1977, pp. 152, 163). Thus, civil rights undermine climate-protection efforts. This argument depends on the climate-policy preferences of citizens (see the discussion of vertical accountability and climate commitment and performance). In addition, the effectiveness of repression, when used to enforce environmental policies, is limited (Stehr, 2015, p. 450; Wurster, 2013, p. 80). Civil rights also enable citizens to demand the implementation of climate policies through the courts. For instance, in Germany, the ENGO Deutsche Umwelthilfe aims to contribute, through the courts, to the implementation of European emissions standards. Spilker (2013, pp. 55, 59) has argued that this democratic trait ensures that local communities can use the courts to pressure firms to consider environmental regulations. According to these arguments, civil rights contribute to efforts to mitigate global warming. The first argument depends on previous government climate change mitigation efforts. With regard to the second argument, the behaviour of firms is also determined by economic competitiveness. Democracies may support environmental protection more often than autocracies because they respect human rights and the lives of their citizens (Burnell, 2012, p. 823; Payne, 1995, p. 43). Berge (1994) describes both democracy and human rights as necessary conditions of sustainable resource use. This mechanism depends on a country's vulnerability to climate change, a factor that varies among countries and has long-term effects on human health (Neumayer, 2002a, p. 141). Consequently, no clear effect of civil rights on climate performance can be assumed. Finally, countries that accept the rule of law at the domestic level may also be more likely to enter into and implement international climate treaties (Brown Weiss & Jakobson, 1999, p. 39; Povitkina, 2018, p. 413). Thus, civil rights may contribute to the ratification of climate treaties.

In sum, the literature review suggests no uniform effect of democracy-quality dimensions on climate commitment and performance. Among democratic qualities, civil rights may contribute to climate commitment and political rights may contribute to climate commitment and performance. It is important to consider treaty design when analysing regime type and climate commitment. There should be a systemic difference between democracies and autocracies, with regard to the ratification of the soft climate treaty (UNFCCC). The International Relations literature assumes that democracies are, in general, more cooperative at the international level than their autocratic counterparts (e.g. democratic peace theory). At the same time, autocracies may ratify the UNFCCC to enhance their international reputations. It is an empirical question whether democracies or autocracies are more likely to ratify the UNFCCC. However, regime type cannot explain Kyoto Protocol ratification. It is easier for governments to join the UNFCCC to boost their international reputations because it does not necessarily have domestic consequences. By contrast, the Kyoto Protocol encompasses binding greenhouse gas emissions reduction goals for developed countries and may require clean development mechanisms and environmental protection efforts in developing countries.

Finally, civil and political rights are likely to affect climate commitment and performance only in the long term. Only then will democratic freedom rights lead to an informed and critical society and the formation of ENGOs (Fredriksson & Neumayer, 2013, p. 12; Gallagher & Thacker, 2008, pp. 8f.). It takes time for governments to develop foreign environmental policies and deal with long-term policy goals, such as climate protection (Fredriksson & Neumayer, 2013, p. 12; Gallagher & Thacker, 2008, pp. 8f.). Kneuer (2012, p. 869) assumes that 'intermediate regimes' could be restricted in their climate policies by institutional instability and 'governance capabilities'. Industry may also invest in environmentally friendly technology in a stable environment (Fredriksson & Neumayer, 2013, p. 12).

4.4.3 Empirical research

In response to global environmental change, scholars have increasingly focused on the effect of regime type on climate commitment and performance. This literature employs statistical analysis methods. Most studies examine whether democracies are more climate-friendly than autocracies. While some studies have applied democracy measures based on a minimalist democracy concept (e.g., Wurster, 2013), most rely on measures that are based on broader democracy understandings (e.g., the *polity2* index from Polity IV, Political Rights and Civil Rights from Freedom House). In the statistical analysis, a continuous or dichotomous variable is applied (see Tables 4.9 & 4.10). The choice of democracy measure or measurement level is often not explained. Although several studies have analysed the robustness of their results using multiple democracy measures (e.g., Bättig & Bernauer, 2009; Neumayer, 2002a; Ruoff, 2009; Spilker, 2013, 2012), most do not discuss their validity and reliability.[51] In comparison to the theoretical literature (e.g., Burnell, 2012; Held & Hervey, 2011), few studies have analysed the effects of specific democratic qualities on climate commitment and performance (e.g., Escher & Walter-Rogg, 2018; Fredriksson & Neumayer, 2013; Wurster, 2013) (see also Böhmelt et al., 2016, p. 1273). Neumayer (2002a) and Midlarsky (2001) acknowledge the different theoretical mechanisms and take this issue into consideration, in

[51] Gallagher and Thacker (2008, p. 11) as well as Ward (2008, p. 390) only refer to high correlations among the Freedom House and Polity IV measures.

their empirical analyses, by using multiple measures of democracy. However, they apply measures that summarise multiple democracy-quality dimensions.

Climate commitment

Climate-commitment studies (see Table 4.9) mostly examine the ratification or ratification delay of international climate agreements as a dependent variable, using statistical analysis methods (see Chapter 2). Quantitative research supports the theoretical expectation that democracies are more committed to climate agreements and ratify international climate agreements faster (e.g. Bättig & Bernauer, 2009; Böhmelt et al. 2016; Dolšak 2009; Fredriksson & Gaston, 2000; Fredriksson & Ujhelyi, 2006; Fredriksson et al., 2007; Gallagher & Thacker, 2008; Li & Reuveny, 2006; Neumayer, 2002a, 2002b; von Stein, 2008; Tubi et al., 2012; Zahran et al., 2007). Most statistical analyses pool developed and developing countries. Neumayer (2002a, p. 157) has found that his results remain the same when he excludes developed countries. By contrast, Von Stein (2008) has found that democracy is only significantly associated with commitment to international climate cooperation in Non-Annex I countries. Kneuer (2012) has observed no difference between democracies in consolidation and established democracies, in relation to national and international climate commitment. However, intermediate regimes show a higher level of international commitment than national commitment (Kneuer, 2012, p. 873).

The theoretical discussion above suggests that democracy-quality dimensions do not have a uniform impact on climate commitment. Few studies have explored the effect of specific institutional traits of democracy on climate commitment. Such studies are needed to determine whether particular aspects of democracy contribute to climate commitment or whether democracies in general are more likely to ratify international climate agreements. Escher and Walter-Rogg (2018) conclude that, among the characteristics of democracy, only political rights contribute to climate commitment.

Climate performance

The empirical literature is ambiguous with regard to the relationship between regime type and climate performance (see Table 4.10). Most statistical studies focus on the combined variation of between- and within-variation, using pooled OLS analyses. Clulow (2018) finds differences in the effect of democracy quality on within- and between-variation. Institutional variables are in general relative constant over time. Thus, it is unlikely that short-term changes in various CO_2 emissions can be traced back to democracy or to institutional aspects of democracy. On the one hand, studies have argued that democracies are associated with implementing climate policies (Dolšak, 2009, p. 561) and have lower CO_2 emissions than autocracies (e.g., Farzin & Bond, 2006, Gleditsch & Sverdrup, 2002; Li & Reuveny, 2006). Other studies have either observed no difference in the climate policy outcomes of democracies and autocracies (e.g., Bättig & Bernauer, 2009; Böhmelt et al., 2016; Frankel & Rose, 2005; Ruoff, 2009; Spilker, 2013, 2012; Wurster, 2013) or have found that autocracies perform better (e.g., Midlarsky, 2001, 1998; Tubi et al., 2012). The results are also ambiguous when developed and developing countries are analysed separately.

Table 4.9 Quantitative research on democracy and climate commitment

Study	Dependent variable	Measurement of democracy	Effect
Fredriksson & Gaston, 2000	Ratification delay	FH Civil liberties	+
Neumayer, 2002a	KP ratification	Combined index of FH Civil liberties and FH Political rights	+
Neumayer, 2002b	KP signature	Multiple dichotomous democracy indicators based on: the combined index of FH Civil Liberties and FH Political rights, *Polity2* from Polity IV, Vanhanen's Index of Democratization, Voice and Accountability from the World Bank	+
Fredriksson & Ujhelyi, 2006	KP ratification & KP ratification delay	FH status index based on FH Civil liberties and FH Political rights (free, partly free, not free)	+
Fredriksson, 2007	KP ratification delay	FH status index based on FH Civil liberties and FH Political rights (free, partly free, not free)	+
Zahran et al., 2008	KP ratification & KP ratification delay	Combined index based on FH Civil liberties and FH Political rights, *polity2* from Polity IV	+
Von Stein, 2008	UNFCCC & KP ratification delay	*Polity2* from Polity IV	+
Bättig & Bernauer, 2009	Climate cooperation commitment index (Bättig & Bernauer, 2009)	FH Political rights	+
Dolšak, 2009	Summary measure of climate policy outputs	FH Civil liberties	+

Notes: + positive effect, / no effect on climate commitment, KP = Kyoto Protocol, FH = Freedom House, BTI = Bertelsmann Transformation Index, V-Dem = Varieties of Democracy.

Table 4.9 Quantitative research on democracy and climate commitment (continuation)

Study	Dependent variable	Measurement of democracy	Effect
Kneuer, 2012	National climate policy component and international climate policy component of the Germanwatch Climate Change Performance Index	Dichotomous indicators on democracies, defective democracy, highly defective democracy, moderate autocracy based on data from the BTI	/
Tubi et al., 2012	Climate cooperation commitment (Bättig & Bernauer, 2009); Climate Laws, Institutions and Measures Index, International component of the Germanwatch Climate Change Performance Index	FH Political rights, *polity2* from Polity IV	+
Yamagata et al., 2013	UNFCCC and KP ratification delay	FH Political rights	+
Bernauer & Böhmelt, 2013	Climate cooperation commitment (Bättig & Bernauer, 2009)	Economist Intelligence Unit's Index of Democracy	Not reported
Böhmelt et al., 2016	Climate cooperation commitment (Bättig & Bernauer, 2009)	*Parcomp* from Polity IV (competitiveness of inclusion), Inclusiveness-Index from Coppedge et al. (2008) based on multiple democracy measures	+
Escher & Walter-Rogg, 2018	Climate cooperation commitment (Bättig & Bernauer, 2009)	V-Dem measures on vertical accountability, horizontal accountability, political rights and civil rights	+ (only political rights)

Notes: + positive effect, / no effect on climate commitment, KP = Kyoto Protocol, FH = Freedom House, BTI = Bertelsmann Transformation Index, V-Dem = Varieties of Democracy.

The findings either suggest that there is no effect of democracy quality in rich and poor countries (e.g., Bättig & Bernauer, 2009; Spilker, 2013, 2012) or that democracy quality alone is associated with lower CO_2 emissions in developing countries (e.g., Biswas et al., 2012; Fuchs et al., 2009). Dolšak (2009, p. 561) finds, in her analysis of climate-policy implementation, no difference between the pooled and separate analyses of developing countries. There are also various findings with regard to the level of democratisation, experience with democracy, and climate policy outcomes. According to Fredriksson and Neumayer (2016, 2013), it is not the current level of democracy but democracy capital that is associated with stricter climate change mitigation policies. Gallagher and Thacker (2008) have found that democracy capital only reduces CO_2 emissions in developing countries. Finally, Kneuer (2012) has shown that, while capitalist autocracies have considerable deficits, intermediate regimes perform well in climate change mitigation.

Christoff and Eckersely (2011, p. 439) conclude that a simple distinction between democracy and autocracy cannot explain cross-national variation in climate performance (see also Wurster, 2013, p. 89). Despite high democracy levels, there are considerable differences in climate performance among developed countries (Christoff & Eckersley, 2011, p. 439; Povitkina, 2018, p. 411). It is important to explain this variation among democracies. Some research has investigated the separate effect of democratic qualities. Empirical research has found no clear support for the argument that institutional constraints contribute to or undermine in climate protection (e.g., Fredriksson & Neumayer, 2013; Garmann, 2014; Wurster, 2013). Fredriksson and Neumayer (2013, p. 18) have found no support for the theory that competitive elections explain cross-national variation in climate-policy stringency. In Böhmelt et al. (2016), democratic inclusiveness contributes to climate commitment but is not statistically associated with climate policy outcomes. Accordingly, Escher and Walter-Rogg (2018) find no effect of vertical and horizontal accountability – or political and civil rights – on CO_2 emissions.

Table 4.10 Quantitative research on democracy and climate performance

Study	Dependent variable/s	Measurement of regime type	Effect
Midlarsky, 1998	CO_2 emissions	FH Political rights, Index of liberal democracy from Bollen (1993), polity from Polity III	-
Midlarsky, 2001	CO_2 emissions	FH Political rights, polity from Polity III, index of liberal democracy from Bollen (1993)	-
Gleditsch & Sverdrup, 2002	CO_2 emissions	Dichotomous democracy indicator based on polity from Polity III Index	+
Frankel & Rose, 2005	CO_2 emissions	*Polity2* from Polity IV	Not reported
Farzin & Bond, 2006	CO_2 emissions	*Polity2* from Polity IV	+
Li & Reuveny, 2006	CO_2 emissions	*Polity2* from Polity IV and dichotomous democracy and autocracy variables based on *polity2*	+
Gallagher & Thacker, 2008	CO_2 emissions	Sum of *polity2* from Polity IV since 1900 with an annual depreciation rate of one percent	+
Bättig & Bernauer, 2009	CO_2 emissions CO_2 emission changes	FH Political rights	/
Dolšak, 2009	Summary measure of climate policy outputs	FH Civil liberties	+
Fuchs et al., 2009	CO_2 emissions CO_2 emission changes	*Polity2* from Polity IV	-
Ruoff, 2009	CO_2 emissions	*Polity2* from Polity IV	/
Biswas et al., 2012	CO_2 emissions	*Polity2* from Polity IV	/

Notes: + positive effect, / no effect, - negative effect on climate performance, KP = Kyoto Protocol, FH = Freedom House, BTI = Bertelsmann Transformation Index, V-Dem = Varieties of Democracy.

Table 4.10 Quantitative research on democracy and climate performance (continuation)

Study	Dependent variable/s	Measurement of regime type	Effect
Kneuer, 2012	Germanwatch Climate Performance Index	BTI democracy classification: established, democracies, democracies, defective democracy, highly defective democracy, moderate autocracy	Intermediate regimes perform well.
Spilker, 2012	CO_2 emissions	*Polity2* from Polity IV	/
Tubi et al., 2012	Climate Laws, Institutions and Measures, Index, National component of the Climate Change Performance Index of Germanwatch, average growth rate of CO_2 emissions from 1990-2004	FH Political rights, *polity2* from Polity IV	-
Bernauer & Böhmelt, 2013	CO_2 emissions	Economist Intelligence Unit's Index of Democracy	Not reported
Fredriksson & Neumayer, 2013	Climate Laws, Institutions and Measures, Index	*Polity2* from Polity IV Sum of democratic years since 1900/1950 based on *polity2* with an annual depreciation rate	/ +
Spilker, 2013	CO_2 emissions	*Polity2* from Polity IV	/
Wurster, 2013	CO_2 emissions	Dichotomous regime type indicator from Cheibub et al. (2010)	/
Böhmelt et al., 2016	CO_2 emissions	*Parcomp* from Polity IV (competitiveness of inclusion), Inclusiveness-Index from Coppedge et al. (2008) based on multiple democracy measures	/

Notes: + positive effect, / no effect, - negative effect on climate performance, KP = Kyoto Protocol, FH = Freedom House, BTI = Bertelsmann Transformation Index, V-Dem = Varieties of Democracy.

Table 4.10 Quantitative research on democracy and climate performance (continuation)

Study	Dependent variable/s	Measurement of regime type	Effect
Fredriksson & Neumayer, 2016	Climate Laws, Institutions and Measures, Index	*Polity2* from Polity IV Sum of democratic years since 1900/1950 based on the *polity2* with an annual depreciation rate	/ +
Clulow, 2018	CO_2 emissions	*Polity2* from Polity IV, Freedom House, V-Dem	+
Povitkina, 2018	CO_2 emissions	V-Dem Liberal Democracy Index	+ in countries with low corruption levels
Escher & Walter-Rogg, 2018	CO_2 emissions per capita	V-Dem measures on vertical accountability, horizontal accountability, political rights and civil rights	/

Notes: + positive effect, / no effect, - negative effect on climate performance, KP = Kyoto Protocol, FH = Freedom House, BTI = Bertelsmann Transformation Index, V-Dem = Varieties of Democracy.

Some studies have found that the effect of democracy on climate performance depends on other variables. Clulow (2018) has shown that democratisation reduces CO_2 emissions in majoritarian electoral systems and increases them in PR systems. Povitkina (2018) has found that democracy is only associated with lower CO_2 emissions in countries with low levels of corruption. As noted in Chapter 3, Ruoff (2009) concludes that democracy strengthens the positive effect of membership in IGOs on CO_2 emissions. Chapter 5 discusses possible moderation effects of regime type and democracy-quality dimensions on the effect of globalisation on climate commitment and performance.

4.4.4 Conclusions

Based on the literature review, this section formulates hypotheses for the empirical analysis (see Table 4.11). As the developed-country sample consists entirely of democracies, this section formulates hypotheses for the pooled analysis of the climate commitment of developed and developing countries and the separate analysis of the climate performance of developing countries (see Chapter 6). The regime type is expected to matter to UNFCCC ratification. Empirical research suggests that democracies are more likely to join soft climate agreements. From a theoretical perspective, it is also possible that autocracies will choose to ratify international climate agreements, such as the UNFCCC. The review of the theoretical discussion suggests that there is no uniform effect of democratic qualities on Kyoto Protocol ratification or climate performance.

Table 4.11 Regime type and climate commitment and performance

	UNFCCC		**Kyoto Protocol**		**Climate Performance**	
	Pooled analysis *Developing countries*		Pooled analysis *Developing countries*		*Developing countries*	
Democracy (Regime type)	$H_{Dem}1.1.1$	/	$H_{Dem}1.2.1$	/		
	$H_{Dem}1.1.2$	+	*$H_{Dem}1.2.2$*	/	*$H_{Dem}1.3.1$*	/
Vertical accountability	$H_{Dem}2.1.1$	/	$H_{Dem}2.2.1$	/		
	$H_{Dem}2.1.2$	/	*$H_{Dem}2.2.2$*	/	*$H_{Dem}2.3.1$*	/
Horizontal accountability	$H_{Dem}3.1.1$	/	$H_{Dem}3.2.1$	/		
	$H_{Dem}3.1.2$	/	*$H_{Dem}3.2.2$*	/	*$H_{Dem}3.3.1$*	/
Political rights	$H_{Dem}4.1.1$	/	$H_{Dem}4.2.1$	+		
	$H_{Dem}4.1.2$	/	*$H_{Dem}4.2.2$*	+	*$H_{Dem}4.3.1$*	/
Civil rights	$H_{Dem}5.1.1$	/	$H_{Dem}5.2.1$	/		
	$H_{Dem}5.1.2$	/	*$H_{Dem}5.2.2$*	/	*$H_{Dem}5.3.1$*	/

Notes: + positive effect, / no effect, - negative effect on climate commitment/ performance, +/- direction unclear.

Among the dimensions of democracy quality, political rights may help to explain the ratification of Kyoto Protocol. These rights enable citizens and interest groups to pressure the government into considering climate protection.

The regime type or specific democracy-quality dimensions may not explain country differences in climate performance. Previous empirical research has shown no relationship between democratic qualities and climate performance. In fact, 'some of the world's leading democracies have also been laggards in climate mitigation' (Clulow, 2018, p. 2) (e.g., Australia, Canada, and the United States). In accordance with the conclusions of Chapter 2, and in contrast to the ratification of climate treaties, the reduction of global air pollution is associated with considerable socio-economic costs. It is more difficult for the public to control climate policy outcomes than climate policy outputs (Cao & Prakash, 2012, p. 67; Neumayer, 2002b, p. 145).

4.5 Conclusions

This chapter has examined the literature on veto players, political corruption, and regime type, in relation to climate commitment and performance. The conclusions serve as basis for an analysis of the joint effect of domestic political institutions and globalisation in the following chapter. Based on existing research, it is important to study the effects of veto players, political corruption, and regime type on the ratification and implementation of climate treaties at a disaggregated level. The veto-player approach identifies ideological distance among veto players and veto points as factors that explain climate commitment and performance. While ideological heterogeneity among veto players and government ideology in the left/right dimension cannot be assumed to affect climate commitment or performance, the effects of specific veto points constitute an empirical question. The literature on political corruption and the environment indicates that political corruption among political decision-makers and public-sector officials undermines climate commitment and performance. The relative importance of both forms of corruption is unclear. While we can assume that democracies and autocracies differ systemically in their ratification of the UNFCCC, no systemic difference between democracies and autocracies in Kyoto Protocol ratification and climate performance can be assumed. However, political rights may contribute to the ratification of hard climate treaties, such as the Kyoto Protocol. In the following chapter, I will argue that the disaggregated analysis of veto players, political corruption, and regime type improves our understanding of the interaction effects of globalisation and these domestic political institutional factors on climate commitment and performance.

References

Bättig, Michèle B., and Thomas Bernauer. 2009. National institutions and global public goods: Are democracies more cooperative in climate change policy? *International Organization* 63(2):281-308.

Bang, Guri, Hovi, Jon, and Detlef F. Sprinz. 2012. US presidents and the failure to ratify multilateral environmental agreements. *Climate Policy* 12(6):755–763.

Barrett, Scott, and Kathryn Graddy. 2000. Freedom, growth, and the environment. *Environment and Development Economics* 5:433–456.

Beer, Samuel. 1998. Liberalism rediscovered: the roots of new Labour. *The Economist* (7 Feb 1998)

Beeson, Mark. 2010. The coming of environmental authoritarianism. *Environmental Politics* 19(2):276–294.

Beeson, Mark. 2016. Environmental authoritarianism and China. In *The Oxford handbook of environmental political theory*, eds. Teena Gabrielson, Cheryl Hall, John M. Meyer, and David Schlosberg, 520–532: Oxford: Oxford University Press.

Beeson, Mark. 2018. Coming to terms with the authoritarian alternative: The implications and motivations of China's environmental policies. *Asia & the Pacific Policy Studies* 5(1):34–46.

Berge, Erling. 1994. Democracy and human rights: Conditions for sustainable resource utilization. In *Who pays the price? The sociocultural context of environmental crisis*, ed. Barbara Rose Johnston, 187–193. Washington, D.C. & Covelo (CA): Island Press.

Bernauer, Thomas, and Tobias Böhmelt. 2013. Are economically "kinder, gentler societies" also greener? *Environmental Science & Technology* 47(21):11993–12001.

Bernauer, Thomas, Tobias Böhmelt, and Vally Koubi. 2013. Is there a democracy-civil society paradox in global governance? *Global Environmental Politics* 13(1):88–107.

Bernauer, Thomas, and Vally Koubi. 2009. Effects of political institutions on air quality. *Ecological Economics* 68(5):1355–1365.

Birchfield, Vicki, and Markus M.L. Crepaz. 1998. The impact of constitutional structures and collective and competitive veto points on income inequality in industrialized democracies. *European Journal of Political Research* 34:175–200.

Biswas, Amit K., Mohammad Reza Farzanegan, and Marcel Thum. 2012. Pollution, shadow economy and corruption: Theory and evidence. *Ecological Economics* 75:114–125.

Böhmelt, Tobias, Thomas Bernauer, and Vally Koubi. 2015. The marginal impact of ENGOs in different types of democratic systems. *European Political Science Review* 7(1):93–118.

Böhmelt, Tobias, Marit Böker, and Hugh Ward. 2016. Democratic inclusiveness, climate policy outputs, and climate policy outcomes. *Democratization* 23(7):1272–1291.

Bollen, Kenneth. 1993. Liberal democracy: Validity and method factors in cross-national measures. *American Journal of Political Science* 37(4):1207–1230.

Brown Weiss, Edith, and Harold K. Jacobson. 1999. Getting countries to comply with internationl agreements. *Environment: Science and Policy for Sustainable Development* 41(6):16–20.

Bueno De Mesquita, Bruce, Alastair Smith, Randolph M. Siverson, and James D. Morrow. 2003. The logic of political survival. Cambridge, MA & London: MIT Press.

Burnell, Peter. 2009. Is democratisation bad for global warming? Coventry: The University of Warwick. Department of Politics and International Studies (CSGR Working Paper 257/09).

Burnell, Peter. 2012. Democracy, democratization and climate change: complex relationships. *Democratization* 19(5):813–842.

Cao, Xun, and Aseem Prakash. 2012. Trade competition and environmental regulations: Domestic political constraints and issue visibility. *The Journal of Politics* 74(1):66–82.

Cao, Xun, and Hugh Ward. 2015. Winning coalition size, state capacity, and time horizons: An application of modified selectorate theory to environmental public goods provision. *International Studies Quarterly* 59(2):264–279.

Carter, Neil. 2013. Greening the mainstream: party politics and the environment. *Environmental Politics* 22(1):73–94.

Carter, Neil, and Michael Jacobs. 2014. Explaining radical policy change: The case of climate change and energy policy under the British Labour government 2006-10. *Public Administration* 92(1):125–141.

Chang, Shu-Chen. 2015. The effects of trade liberalization on environmental degradation. *Quality & Quantity* 49(1):235–253.

Chappell, Louise. 2001. Federalism and social policy: The case of domestic violence. *Australian Journal of Public Administration* 60(1):59–69.

Cheibub, José Antonio, Jennifer Gandhi, and James Raymond Vreeland. 2010. Democracy and dictatorship revisited. *Public Choice* 143(1-2):67–101.

Chhibber, Pradeep, and Irfan Nooruddin. 2004. Do party systems count? *Comparative Political Studies* 37(2):152–187.

Christoff, Peter, and Robyn Eckersley. 2011. Comparing state responses. In *Oxford handbook of climate change and society*, eds. John S. Dryzek, Richard B. Norgaard, and David Schlosberg, 431–448. Oxford et al.: Oxford University Press.

Clar, Christoph, Andrea Prutsch, and Reinhard Steurer. 2013. Barriers and guidelines for public policies on climate change adaptation: A missed opportunity of scientific knowledge-brokerage. *Natural Resources Forum* 37(1):1–18.

Clulow, Zeynep. 2018. Democracy, electoral systems and emissions: explaining when and why democratization promotes mitigation. *Climate Policy* 36:1–14.

Cole, Matthew A. 2007. Corruption, income and the environment: An empirical analysis. *Ecological Economics* 62(3-4):637–647.

Collier, David, and Robert Adcock. 1999. Democracy and dichotomies: A pragmatic approach to choices about concepts. *Annual Review of Political Science* 2(1):537–565.

Collier, David, and Steven Levitsky. 1997. Democracy with adjectives. Conceptual innovation in comparative research. *World Politics* 49:430–451.

Congleton, Roger D. 1992. Political institutions and pollution control. *The Review of Economics and Statistics* 74(3):412–421.

Congleton, Roger D. 2002. Governing the global environmental commons: The political economy of international environmental treaties and institutions. In *International Environmental Economics. A Survey of the Issues*, eds. Günther Schulze, and Heinrich W. Ursprung, 241–263. Oxford: Oxford University Press.

Coppedge, Michael, John Gerring, David Altman, Michael Bernhard, Steven Fish, and Allen Hicken. 2011. Conceptualizing and measuring democracy: A new approach. *Perspectives on Politics* 9(2):247–267.

Coppedge, Michael, Staffan Lindberg, Svend-Erik Skaaning, and Jan Teorell. 2016. Measuring high level democratic principles using the V-Dem data. *International Political Science Review* 37(5):580–593.

Crowley, Kate. 2007. Is Australia faking it? The Kyoto Protocol and the greenhouse policy challenge. *Global Environmental Politics* 7(4):118–139.

Cruz, Cesi, Philip Keefer, and Carlos Scartascini. 2016. Database of political institutions dataset, 2015 update (DPI2015). Updated version of Beck, Thorsten, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh. 2001. New tools in comparative political economy: The database of political institutions. *World Bank Economic Review* 15(1):165-176. Washington, D.C.: Inter-American Development Bank. http://www.iadb.org/en/research-and-data/publication-details,3169.html?pub_id=IDB-DB-121. Accessed 18 May 2016.

Dahlström, Carl, Johannes Lindvall, and Bo Rothstein. 2013. Corruption, bureaucratic failure and social policy priorities. *Political Studies* 61(3):523–542.

Damania, Richard. 2002. Environmental controls with corrupt bureaucrats. *Environment and Development Economics* 7(3):407–427.

Damania, Richard, Per G. Fredriksson and John A. List. 2003. Trade liberalization, corruption, and environmental policy formation: theory and evidence. *Journal of Environmental Economics and Management* 46:490–512.

Desai, Uday. 1998a. Environment, economic growth, and government in developing countries. In *Ecological Policy and Politics in Developing Countries. Economic Growth, Democracy, and Environment*, ed. Uday Desai, 1–45. New York: State University of New York Press.

Desai, Uday. 1998b. Poverty, government, and the global environment. In *Ecological policy and politics in developing countries: Economic growth, democracy, and environment*, ed. Uday Desai, 297–305. New York: State University of New York Press.

Desai, Uday. 2002. Institutions and environmental policy in developed countries. In *Environmental politics and policy in industrialized countries*, ed. Uday Desai, 1–27. Cambridge (MA) & London: The MIT Press.

Diamond, Larry, and Leonardo Morlino. 2005. Introduction. In *Assessing the quality of democracy*, eds. Larry Diamond, and Leonardo Morlino, xi–xliii. Baltimore: The John Hopkins University Press

Doherty, Brian, and Marius de Geus. 1996. Democracy and green political thought. Sustainability, rights and citizenship. In *Democracy and green political thought. Sustainability, right and citizenship*, eds. Brian Doherty, and Marius de Geus, 1–15. London & New York: Routledge.

Dolšak, Nives. 2001. Mitigating global climate change: Why are some countries more committed than others? *Policy Studies Journal* 29(3):414–436.

Dolšak, Nives. 2009. Climate change policy implementation: A cross-sectional analysis. *Review of Policy Research* 26(5):551–570.

Duit, Andreas. 2014. Introduction: The comparative study of environmental governance. In *State and environment. The comparative study of environmental governance*, ed. Andreas Duit, 1–24. Cambridge (MA) & London: MIT Press.

Dunlap, Riley E., and Michael P. Allen. 1976. Partisan differences on environmental issues: A congressional roll-call analysis. *Western Political Quarterly* 29(3):384–397.

Dunlap, Riley E., Aaron M. McCright, and Jerrod H. Yarosh. 2016. The political divide on climate change: Partisan polarization widens in the U.S. *Environment: Science and Policy for Sustainable Development* 58(5):4–23.

Elkins, Zachary. 2000. Gradations of democracy? Empirical tests of alternative conceptualizations. *American Journal of Political Science* 44(2):293–300.

Escher, Romy, and Melanie Walter-Rogg. 2020. Environmental Performance in Democracies and Autocracies. Democratic Qualities and Environmental Protection. Cham: Palgrave Macmillan.

Escher, Romy, and Melanie Walter-Rogg. 2018. Does the conceptualization and measurement of democracy quality matter in comparative climate policy research? *Politics and Governance* 6(1):117–144.

Farzin, Y. Hossein, and Craig A. Bond. 2006. Democracy and environmental quality. *Journal of Development Economics* 81(1):213–235.

Fiorino, Daniel J. 2011. Explaining national environmental performance: approaches, evidence, and implications. *Policy Sciences* 44(4):367–389.

Fliegauf, Mark T., and Sanga, Sarath 2010. Steering toward climate tyranny? http://www.eisanet.org/sitecore/content/bebruga/eisa/publications/feeds/stockholm.aspx. Accessed 2 Nov 2017.

Frankel, Jeffrey A., and Andrew K. Rose. 2005. Is trade good or bad for the environment? Sorting out the causality. *Review of Economics and Statistics* 87(1):85–91.

Fredriksson, Per G., and Noel Gaston. 2000. Ratification of the 1992 climate change convention: What determines legislative delay? *Public Choice* 104:345–368.

Fredriksson, Per G., and Eric Neumayer. 2013. Democracy and climate change policies: Is history important? *Ecological Economics* 95:11–19.

Fredriksson, Per G., and Eric Neumayer. 2016. Corruption and climate change policies: Do the bad old days matter? *Environmental and Resource Economics* 63(2):451–469.

Fredriksson, Per G., Eric Neumayer, Richard Damania, and Scott Gates. 2005. Environmentalism, democracy, and pollution control. *Journal of Environmental Economics and Management* 49, 343–365.

Fredriksson, Per G., Eric Neumayer, and Gergely Ujhelyi. 2007. Kyoto Protocol cooperation: Does government corruption facilitate environmental lobbying? *Public Choice* 133(1-2):231–251.

Fredriksson, Per G., and Jakob Svensson. 2003. Political instability, corruption and policy formation: the case of environmental policy. *Journal of Public Economics* 87(7-8):1383–1405.

Fredriksson, Per G., and Gergely Ujhelyi. 2006. Political institutions, interest groups, and the ratification of international environmental agreements. https://www.researchgate.net/profile/Per_Fredriksson. Accessed 13 Nov 2019.

Fredriksson, Per G., and Jim R. Wollscheid. 2007. Democratic institutions versus autocratic regimes: The case of environmental policy. *Public Choice* 130(3-4):381–393.

Freedom House. 2017. Freedom in the world 2017. https://freedomhouse.org/report/freedom-world/freedomworld-2017. Accessed 7 Jun 2018.

Fuchs, Doris, Detlef Sprinz, Michael Aklin, and Richard Meyer-Eppler. 2009. Does politics impact carbon emissions? Münster: Universität Münster. FB Erziehungswissenschaft und Sozialwissenschaften. Institut für Politikwissenschaft. https://nbnresolving.org/urn:nbn:de:0168-ssoar-257419. Accessed 14 Nov 2019.

Galarraga, Ibon, Mikel Gonzalez-Eguino, and Anil Markandya. 2011. The role of regional governments in climate change policy. *Environmental Policy and Governance* 21(3):164–182.

Gallagher, Kevin P., and Strom C. Thacker. 2008. Democracy, income, and environmental quality. Amherst: Political Economy Research Institute. University of Massachusetts. (Working Paper Series 164).

Ganghof, Steffen. 2003. Promises and pitfalls of veto player analysis. *Swiss Political Science Review* 9(2):1–25.

Garmann, Sebastian. 2014. Do government ideology and fragmentation matter for reducing CO_2-emissions? Empirical evidence from OECD countries. *Ecological Economics* 105, S. 1–10.

Geissel, Brigitte, Marianne Kneuer, and Hans-Joachim Lauth. 2016. Measuring the quality of democracy: Introduction. *International Political Science Review* 37(5):571–579.

Gilley, Bruce. 2012. Authoritarian environmentalism and China's response to climate change. *Environmental Politics* 21(2):287–307.

Gleditsch, Nils Petter, and Bjørn Sverdrup. 2002. Democracy and the environment. In *Human Security and the Environment. International Comparisons*, eds. Edward A. Page, and Michael Redclift, 45–70. Cheltenham & Northhampton (MA): Edward Elgar.

Goldsmith, Arthur A. 2007. Is governance reform a catalyst for development? *Governance* 20(2):165–186.

Gore, Al. 1992. Earth in the balance. Ecology and the human spirit. New York et al.: Plume.

Goulder, Lawrence H., and Robert N. Stavins. 2010. Interactions between state and federal climate change policies. Cambridge: National Bureau of Economic Research. (Working Paper 16123).

Hadenius, Axel, and Jan Teorell. 2007. Pathways from authoritarianism. *Journal of Democracy* 18(1):143–156.

Hahn, Robert W. 1990. The political economy of environmental regulation: Towards a unifying framework. *Public Choice* 65(1):21–47.

Halkos, George E., Aksel Sundström, and Nickolaos G. Tzeremes. 2015. Regional environmental performance and governance quality: a nonparametric analysis. *Environmental Economics and Policy Studies* 17(4):621–644.

Hardin, Garrett. 1968. The tradegy of the commons. *Science* 162:1243–1248.

Harrison, Kathryn. 2007. The road not taken: Climate change policy in Canada and the United States. *Environmental Politics* 7(4):92–117.

Harrison, Kathryn, and Lisa McIntosh Sundstrom. 2007. The comparative politics of climate change. *Global Environmental Politics* 7(4):1–18.

Harrison, Kathryn, and Lisa McIntosh Sundstrom. 2010a. Introduction: Global commons, domestic decisions. In *Global commons, domestic decisions. The comparative politics of climate change*, eds. Kathryn Harrison, and Lisa McIntosh Sundstrom, 1-22. Cambridge & London: The MIT Press.

Harrison, Kathryn, and Lisa McIntosh Sundstrom. 2010b. Conclusion: The comparative politics of climate change. In *Global commons, domestic decisions. The comparative politics of climate change*, eds. Kathryn Harrison, and Lisa McIntosh Sundstrom, 261–290. Cambridge & London: The MIT Press.

Heilbroner, Robert L. 1974. An inquiry into the human prospect. New York: Norton.

Held, David. 2006. Models of democracy. Cambridge: Polity.

Held, David, and Angus Hervey. 2011. Democracy, climate change and global governance: Democratic agency and the policy menu ahead. In *The Governance of Climate Change. Science, Economics, Politics and Ethics*, eds. David Held, Angus Hervey, and Marik Theros, 89–110. Cambridge & Malden: Polity Press.

Henisz, Witold J. 2002. The institutional environment for infrastructure investment. *Industrial and Corporate Change* 11(2):355–389.

Henry, Laura A., and Lisa McIntosh Sundstrom. 2010. Russia and the Kyoto Protocol: From hot air to implementation. In *Global commons, domestic decisions. The comparative politics of climate change*, eds. Kathryn Harrison, and Lisa McIntosh Sundstrom, 105–138. Cambridge & London: The MIT Press.

Hibbs, Douglas A., JR. 1977. Political parties and macroeconomic policy. *The American Political Science Review* 71(4):1467–1487.

Hibbs, Douglas A., JR. 1992. Partisan theory after fifteen years. *European Journal of Political Economy* 8:361–373.

Hofrichter, Jürgen, and Karlheinz Reif. 1990. Evolution of environmental attitudes in the European Community. *Scandinavian Political Studies* 13(2):119–146.

Holden, Barry. 2002. Democracy and global warming. London & New York, NY: Continuum.

Holmberg, Sören, Bo Rothstein, and Naghmeh Nasiritousi. 2009. Quality of government: what you get. *Annual Review of Political Science* 12(1):135–161.

Huber, John, and Ronald Inglehart. 1995. Expert interpretations of party space and party locations in 42 societies. *Party Politics* 1(1):73–111.

Hudson, Blake. 2012. Federal constitutions, global governance, and the role of forests in regulating climate change. *Indiana Law Journal* 87:1455–1515.

Imbeau, Louis M., Francois Pétry, and Moktar Lamari. 2001. Left-right party ideology and government policies: A meta-analysis. *European Journal of Political Research* 40:1–29.

Immergut, Ellen M., and Matthias Orlowski. 2013. Veto points and the environment. In *Staatstätigkeiten, Parteien und Demokratie. Festschrift für Manfred G. Schmidt*, ed. Klaus Armingeon, 205–217. Wiesbaden: Springer VS.

Jahn, Detlef. 1998. Environmental performance and policy regimes: Explaining variations in 18 OECD-countries. *Policy Sciences* 31(2):107–131.

Jahn, Detlef. 2008. The politics of climate change. Paper prepared for delivery at the 2008 Joint Sessions of Workshops Friday 11th-Wednesday 16th April 2008 in Rennes (France) in the Workshop "The Politics of Climate Change" organized by Hugh Compston (Cardiff University). https://ecpr.eu/Filestore/PaperProposal/b230ae79-4191-48be-93d3-631a05c7b90f.pdf. Accessed 13 Nov 2019.

Jahn, Detlef. 2010. The veto player approach in macro-comparative politics: Concepts and measuruement. In *Reform processes and policy change*, eds. Thomas König, Marc Debus, and George Tsebelis, 43–68. New York, NY: Springer.

Jahn, Detlef. 2016. The politics of environmental performance. Institutions and preferences in industrialized democracies. Cambridge: Cambridge University Press.

Jahn, Detlef, and Ferdinand Müller-Rommel. 2010. Political institutions and policy performance: A comparative analysis of Central and Eastern Europe. *Journal of Public Policy* 30(1): 23–44.

Jahn, Detlef, and Sonja Wälti. 2007. Umweltpolitik und Föderalismus. In *Politik und Umwelt* (Politische Vierteljahresschrift Sonderheft 39/2007), eds. Jacob Klaus, Frank Biermann, Per-Olof Busch, and Peter H. Feindt, 262–279. Wiesbaden: VS Verlag für Sozialwissenschaften.

Jensen, Christian B., and Jae-Jae Spoon. 2007. Putting the party back in: Explaining EU member state compliance with the Kyoto Protocol, 1998-2003. Paper prepared for presentation at the European Union Studies Association Meeting, 16-20 May 2007, Montreal. http://aei.pitt.edu/7919/1/jensen-c-04h.pdf. Assessed 14 Nov 2019.

Jensen, Christian B., and Jae-Jae Spoon. 2011. Testing the 'party matters' thesis: Explaining progress towards Kyoto Protocol targets. *Political Studies* 59(1):99–115.

Kaufmann, Daniel, Aart Kraay, and Pablo Zoido-Lobatón. 1999. Governance Matters. Washington, D.C.: The World Bank Development Research Group Macroeconomics and Growth and World Bank Institute Governance, Regulation, and Finance (Policy Research Working Paper 2196).

Kim, So Young, and Yael Wolinsky-Nahmias. 2014. Cross-national public opinion on climate change: The effects of affluence and vulnerability. *Global Environmental Politics* 14(1):79–106.

Kincaid, John. 2001. Economic policy-making: advantages and disadvantages of the federal model. *International Social Science Journal* 53(167):85–92.

Kitschelt, Herbert P. 1988. Left-libertarian parties: explaining innovation in competitive party systems. *World Politics* 40(2):194–234.

Kloepfer, Michael. 2004. Federalismusreform und Umweltrecht*. *Natur und Recht* 26 (12):759–764.

Knack, Stephen. 2006. Measuring corruption in Eastern Europe and Central Asia. A critique of the cross-country indicators. Washington, D.C.: World Bank (World Bank Policy Research Working Paper 3968).

Kneuer, Marianne. 2012. Who is greener? Climate action and political regimes: trade-offs for national and international actors. *Democratization* 19(5):865–888.

Knill, Christoph, Marc Debus, and Stephan Heichel. 2010. Do parties matter in internationalised policy areas? The impact of political parties on environmental policy outputs in 18 OECD countries, 1970-2000. *European Journal of Political Research* 49(3):301–336.

Kurer, Oskar. 2005. Corruption: An alternative approach to its definition and measurement. *Political Studies* 53:222–239.
Lafferty, William M., and James Meadowcroft. 1997. Democracy and the environment: congruence and conflict – preliminary reflections. In D*emocracy and the Environment. Problems and Prospects*, eds. William M. Lafferty, and James Meadowcroft, 1–17. Cheltenham & Lyme: Edward Elgar.
Lake, David A., and Matthew A. Baum. 2001. The invisible hand of democracy. Political control and the provision of public services. *Comparative Political Studies* 34(6):587–621.
Lantis, Jeffreyh S. 2009. The life and death of international treaties. Double-edged diplomacy and the politics of ratification in comparative perspective. Oxford: Oxford University Press.
Leitão, Alexandra. 2010. Corruption and the environmental Kuznets curve: Empirical evidence for sulfur. *Ecological Economics* 69(11):2191–2201.
Li, Quan, and Rafael Reuveny. 2006. Democracy and environmental degradation. *International Studies Quarterly* 50(4):935–956.
Lijphart, Arend. 2012 [1999]. Patterns of democracy. Government forms and performance in thirty-six countries. Second Edition. New Haven & London: Yale University Press.
Lim, Sijeong, and Andreas Duit. 2018. Partisan politics, welfare states, and environmental policy outputs in the OECD countries, 1975-2005. *Regulation & Governance* 12 (2):220–237.
List, John A., and Daniel M. Sturm. 2006. How elections matter: Theory and evidence from environmental policy. *The Quarterly Journal of Economics* 121(4):1249–1281.
López, Ramón, and Siddhartha Mitra. 2000. Corruption, pollution, and the Kuznets environment curve. *Journal of Environmental Economics and Management* 40(2):137–150.
Madden, Nathan J. 2014. Green means stop: veto players and their impact on climate-change policy outputs. *Environmental Politics* 23(4):570–589.
McMann, Kelly, Daniel Pemstein, Brigitte Seim, Jan Teorell, and Staffan I. Lindberg. 2016. Strategies of validation: Assessing the varieties of democracy corruption data. Gothenburg: University of Gothenburg. The Varieties of Democracy Institute & Department of Political Science. (Working Paper 23).
Mercier, Jean. 2006. American hesitations to reduce greenhouse gas emissions: an institutional interpretation. *International Review of Administrative Sciences* 72(1):101–121.
Merkel, Wolfgang. 2004. Embedded and defective democracies. *Democratization* 11(5):33–58.
Merkel, Wolfgang. 2016. Eingebettete und defekte Demokratien. In *Zeitgenösische Demokratietheorie. Band 2: Empirische Demokratietheorien*, eds. Oliver W. Lembcke, Claudia Ritzi, and Gary S. Schaal, 455–484.Wiesbaden: Springer VS.
Midlarsky, Manus I. 1998. Democracy and the environment: An empirical assessment. *Journal of Peace Research* 35(3):341–361.
Midlarsky, Manus I. 2001. Democracy and the environment. In *Environmental Conflict*, eds. Paul F. Diehl and Nils Petter Gleditsch, 155–178. Boulder & Oxford: Westview Press.
Miller, Michael J. 2011. Persistent illegal logging in Costa Rica: The role of corruption among forestry regulators. *The Journal of Environment & Development* 20(1):50–68.
Milner, Helen V. 1993. Maintaining international commitments in trade policy. In *Do institutions matter? Government capabilities in the United States and abroad*, eds. R. Kent Weaver, and Bert A. Rockman, 345–369. Washington, D.C.: The Brookings Institution.
Morse, Stephan. 2006. Is corruption bad for environemntal sustainability? A cross-national analysis. *Ecology and Society* 11(1), no page numbers.
Munck, Gerardo L., and Jay Verkuilen. 2002. Conceptualizing and measuring democracy. *Comparative Political Studies* 35(1):5–34.
Neumayer, Eric. 2002a. Do democracies exhibit stronger international environmental commitment? A cross-country analysis. *Journal of Peace Research* 39(2):139–164.
Neumayer, Eric. 2002b. Does trade openness promote multilateral environmental cooperation? *The World Economy* 25(6): 815–32.
Neumayer, Eric. 2003. Are left-wing party strength and corporatism good for the environment? Evidence from panel analysis of air pollution in OECD countries. *Ecological Economics* 45(2):203–220.
Never, Babette, and Joachim Betz. 2014. Comparing the climate policy performance of emerging economies. *World Development* 59:1–15.
Nye, Joseph. 1967. Corruption and political development: A cost-benefit analysis. *American Political Science Association* 61(2):417–427.
O'Donnell, Guillermo A. 1994. Delegative democracy. *Journal of Democracy* 5(1):55–69.
Olson, Mancur. 1982. The rise and decline of nations. New Haven: Yale University Press.
Ophuls, William. 1977. Ecology and the politics of scarcity: Prologue to a political theory of the state. San Francisco: W.H. Freeman.
Ophuls, William, 1994. Requiem for modern politics: The tragedy of the enlightenment and the challenge of the new millennium. Boulder: Westview Press.
Ophuls, William, and Stephan A. Boyan. 1992. Ecology and the politics of scarcity revisited: The unraveling of the American dream. New York: W.H. Freeman.
Padró i Miquel, Gerard. 2007. The control of politicians in divided societies: The politics of fear. *The Review of Economic Studies* 74(4):1259–1274.
Paehlke, Robert. 1997. Environmental challenges to democratic practice. In *Democracy and the environment. Problems and prospects*, eds. William M. Lafferty, and James Meadowcroft, 18–38. Cheltenham & Lyme: Edward Elgar.
Payne, Rodger A. 1995. Freedom and the environment. *Journal of Democracy* 6(3):41–55.
Pellegrini, Lorenzo. 2011. Corruption, development and the environment. Dordrecht: Springer Netherlands.
Pellegrini, Lorenzo, and Reyer Gerlagh. 2006. Corruption, democracy, and environmental policy. *The Journal of Environment & Development* 15(3):332–354.

Persson, Torsten, Gerard Roland, and Guido Tabellini. 2000. Comparative politics and public finance. *Journal of Political Economy* 108(6):1121–1161.

Persson, Torsten, Gerard Roland, and Guido Tabellini. 2007. Electoral rules and government spending in parlimanetary democracies. *Quarterly Journal of Political Science* 2(2):155–188.

Persson, Torsten, and Guido Tabellini. 1999. The size and scope of government: Comparative politics with rational politicians. *European Economic Review* 43:699–735.

Petherick, Anna. 2014. Seeking a fair and sustainable future. *Nature Climate Change* 4(2):81–83.

Pierson, Paul. 1995. Fragmented welfare states: Federal institutions and the development of social policy. *Governance* 8(4):449–478.

Pinto, Pablo M. 2013. Partisan investment in the global economy. Why the left loves foreign direct investment and FDI loves the left. Cambridge et al.: Cambridge University Press.

Poloni-Staudinger, Lori M. 2008. Are consensus democracies more environmentally effective? *Environmental Politics* 17(3):410–430.

Povitkina, Marina. 2018. The limits of democracy in tackling climate change. *Environmental Politics* 27(3):411–432.

Rechia, Steven P. 2002. International environmental treaty engagement in 19 democracies. *Policy Studies Journal* 30(4):470–494.

Risse, Thomas. 2000. Rational choice, constructivism, and the study of international institutions. Presented at the Annual Meeting of the American Political Science Assoication, Washington DC, August 31- September 3, 2000.

Robbins, Paul. 2000. The rotten institution: corruption in natural resource management. *Political Geography* 19(4):423–443.

Rohrschneider, Robert. 1988. Citizens' attitudes toward environmental issues. *Comparative Political Studies* 21(3):347–367.

Rose-Ackermann, Susan, and Bonnie J. Palifka. 2016. Corruption and government. Causes, consequences, reform. Second Edition. New York: Cambridge University Press.

Rothstein, Bo, and Daniel Eek. 2009. Political corruption and social trust. *Rationality and Society* 21(1):81–112.

Rothstein, Bo, and Jan Teorell. 2008. What is quality of government? A theory of impartial Government Institutions. *Governance: An International Journal of Policy, Administration, and Institutions* 21(2):165–190.

Ruoff, Gabriele. 2009. Grow rich and clean up later? Joint effects of IGO membership and democracy on environmental performance in developing countries. National Centre of Competence in Research (NCCR) (Challenges to Democracy in the 21st Century Working Paper 33).

Schmidt, Manfred G. 1996. When parties matter: A review of the possibilities and limits of partisan influence on public policy. *European Journal of Political Research* 30:155–183.

Schmidt, Manfred G. 2001. Parteien und Staatstätigkeit. Zentrum für Sozialpolitik. Universität Bremen. (ZeS-Arbeitspapier 2).

Schmidt, Manfred G., and Tobias Ostheim. 2007a. Die Lehre von der Parteiendifferenz. In *Der Wohlfahrtsstaat. Eine Einführung in den historischen und internationalen Vergleich*, eds. Manfred G. Schmidt, Tobias Ostheim, Nico A. Siegel, and Reimut Zohlnhöfer, 51–62.Wiesbaden: VS Verlag für Sozialwissenschaften.

Schmidt, Manfred G., and Tobias Ostheim. 2007b. Politisch-institutionalistische Theorien. In *Der Wohlfahrtsstaat. Eine Einführung in den historischen und internationalen Vergleich*, eds. Manfred G. Schmidt, Tobias Ostheim, Nico A. Siegel, and Reimut Zohlnhöfer, 63–74.Wiesbaden: VS Verlag für Sozialwissenschaften.

Schulze, Kai. 2014. Do parties matter for international environmental cooperation? An analysis of environmental treaty participation by advanced industrialised democracies. *Environmental Politics* 23(1):115–139.

Scruggs, Lyle A. 1999. Institutions and environmental performance in seventeen western democracies. *British Journal of Political Science* 29(1):1–31.

Shearman, David, and Joseph Wayne Smith. 2007. The climate change challenge and the failure of democracy. Westport (CT) & London: Praeger Publishers.

Smith, Robert J., and Matthew J. Walpole. 2005. Should conservationists pay more attention to corruption? *Oryx* 39(3):251 – 256.

Spilker, Gabriele. 2012. Helpful organizations: Membership in inter-governmental organizations and environmental quality in developing countries. *British Journal of Political Science* 42(2):345–370.

Spilker, Gabriele. 2013. Globalization, political institutions and the environment in developing countries. New York, London: Routledge.

Stadelmann-Steffen, Isabelle. 2011. Citizens as veto players: climate change policy and the constraints of direct democracy. *Environmental Politics* 20(4):485–507.

Stehr, N. 2015. Democracy is not an inconvenience. *Nature Climate Change* 525(24):449–450.

Steuer, Reinhard, and Christoph Clar. 2015. Is decentralisation always good for climate change mitigation? How federalism has complicated the greening of policies in Austria. *Policy Sciences* 48:85–107.

Sussman, Glen. 2004. The USA and global environmental policy: Domestic constraints on effective leadership. *International Political Science Review* 25(4):349–369.

Tanzi, Vito, and Hamid Davoodi. 1998. Corruption, public investment, and growth. In *The welfare state, public investment, and growth. Selected Papers from the 53rd Congress of the International Institute of Public Finance*, eds. Shibata Hirofumi, and Toshihiro Ihori, 41–60. Tokyo et al.: Springer.

Thérien, Jean-Phillippe. 2002. Debating foreign aid: Right versus left. *Third World Quarterly* 23(3):449-466.

Tobin, Paul. 2017. Leaders and laggards: Climate policy ambition in developed states. *Global Environmental Politics* 17(4):28–47.

Touraine, Alain, Michael Wieviorka, and François Dubet. 1987. The workers' movement. Cambridge et al.: Cambridge University Press.

Treisman, Daniel. 2000. The causes of corruption: a cross-national study. *Journal of Public Economics* 76(3):399–457.

Treisman, Daniel. 2007. What we learned about the causes of corruption from ten years of cross-national empirical research? *American Review of Political Science* 10:211–244.

Tsebelis, George. 2010. Veto player theory and policy change: An introduction. In *Reform processes and policy change*, eds. Thomas König, Marc Debus, and George Tsebelis, 3–18 New York, NY: Springer.

Tsebelis, George. 1995. Decision making in political systems: Veto players in presidentialism, parliamentarism, multicameralism and multipartyism. *British Journal of Political Science* 25(3):289–325.

Tsebelis, George. 1999. Veto players and law production in parliamentary democracies: An empirical analysis. *American Political Science Review* 93(3):591–608.

Tsebelis, George. 2002. Veto players. How political institutions work. New York & Princeton (NJ): Rusell Sage Foundation & Princeton University Press.

Tubi, Amit, Itay Fischhendler, and Eran Feitelson. 2012. The effect of vulnerability on climate change mitigation policies. *Global Environmental Change* 22(2):472–482.

Underdal, Arild. 2010. Complexity and challenges of long-term environmental governance. *Global Environmental Change* 20(3):386–393.

Vogel, David. 1995. Trading Up. Consumer and environmental regulation in a global environment. Cambridge (MA) & London.

von Stein, Jana. 2008. The international law and politics of climate change. Ratification of the United Nations Framework Convention and the Kyoto Protocol. *Journal of Conflict Resolution* 52(2):243–268.

Wahman, Michael, Jan Teorell, and Axel Hadenius. 2013. Authoritarian regime types revisited: updated data in comparative perspective. *Contemporary Politics* 19(1):19–34.

Wälti, Sonja. 2004. How multilevel structures affect environmental policy in industrialized countries. *European Journal of Political Research.* 43(4):599–634.

Ward, Hugh. 2008. Liberal democracy and sustainability. *Environmental Politics* 17(3):386–409.

Ward, Hugh, Xun Cao, and Bumba Mukherjee. 2014. State capacity and the environmental investment gap in authoritarian states. *Comparative Political Studies* 47(3):309–343.

Weaver, R. Kent, and Bert A. Rockman. 1993. Assessing the effects of institutions. In *Do Institutions Matter? Government Capabilities in the United States and Abroad*, eds. R. Kent Weaver, and Bert A. Rockman, 1–41. Washington, D.C.: The Brookings Institution.

Welsch, Heinz. 2004. Corruption, growth, and the environment: a cross-country analysis. *Environment and Development Economics* 9(5):663–693.

Wenzelburger, Georg, and Frieder Neumann 2015. Vergleichende Staatstätigkeitsforschung: Entwicklungslinien - Heidelberger Schule - integrative Erklärungsansätze. In *Einführung in die Vergleichende Politikwissenschaft. Institutionen – Akteure – Policies*, eds. Uwe Wagschal, Sebastian Jäckle, and Georg Wenzelburger, 251–264. Stuttgart: Verlag W. Kohlhammer.

Wenzelburger, Georg, and Reimut Zohlnhöfer. 2014. Institutionen und Public Policies. In *Lehrbuch der Politikfeldanalyse*. 3., aktualisierte und überarbeitete Auflage, eds. Klaus Schubert, and Nils C. Bandelow, 311-340. Munich: De Gruyter & Oldenbourg.

Wilson, John K., and Richard Damania. 2005. Corruption, political competition and environmental policy. *Journal of Environmental Economics and Management* 49(3):516–535.

Wurster, Stefan. 2013. Comparing ecological sustainability in autocracies and democracies. *Contemporary Politics* 19(1):76–93.

Yamagata, Yoshiki, Jue Yang, and Joseph Galaskiewicz. 2013. A contingency theory of policy innovation: how different theories explain the ratification of the UNFCCC and Kyoto Protocol. *International Environmental Agreements: Politics, Law and Economics* 13(3):251–270.

Zahran, Sammy, Eunyi Kim, Xi Chen, and Mark Lubell. 2007. Ecological development and global climate change: A cross-national study of Kyoto Protocol ratification. *Society & Natural Resources* 20(1):37–55.

Zohlnhöfer, Reimut. 2003. George Tsebelis: Veto players. How political institutions work. New York & Princeton: Russell Sage Foundation & Princeton University Press 2002, 317 S., £ 13,95. *Politische Vierteljahresschrift* 44(2):255–258.

Zohlnhöfer, Reimut. 2005. Globalisierung der Wirtschaft und nationalstaatliche Anpassungsreaktionen. Theoretische Überlegungen. *Zeitschrift für Internationale Beziehungen* 12(1):41–75.

Zohlnhöfer, Reimut. 2008. Stand und Perspektiven der vergleichenden Staatstätigkeitsforschung. In *Die Zukunft der Policy-Forschung*, eds. Frank Janning, and Katrin Toens, 157–174. Wiesbaden: VS Verlag für Sozialwissenschaften.

5 Globalisation, domestic political institutions, and climate commitment and performance

Abstract

The broader literature on the environmental consequences of globalisation explores the importance of veto players, regime type, and political corruption. The study applies these themes to an analysis of climate commitment and performance. To formulate hypotheses for the empirical analysis, this chapter begins by specifying the causal order and interrelationship of domestic and international explanatory factors; on this basis, it develops explanatory models of the joint influence of globalisation with veto players, political corruption, and regime type. This chapter argues that, while domestic political institutions should not influence competition pressures caused by economic interdependence, they can moderate the effects of economic openness and political globalisation. The veto-player approach adds little to our understanding of the relationship between globalisation and climate commitment and performance. Left- and right-wing veto players consider a country's international competitiveness. The importance of specific veto points is theoretically ambiguous. According to previous research, political corruption is likely to moderate the effect of economic openness on climate performance in developing countries. In contrast to previous research, the present study distinguishes between forms of political corruption. Second, this chapter explains that regime type can influence the relationship between globalisation, climate commitment, and climate performance. It adds to research showing that, compared to the UNFCCC, there is no systemic difference between democracies and autocracies in the effect of political globalisation on the harder Kyoto Protocol. However, political and civil rights, together with political globalisation, contribute to Kyoto Protocol ratification. It also explores the effect of economic openness on climate performance. It is an empirical question whether the negative effect of economic openness is stronger or weaker in developing countries with high levels of political and/or civil rights.

Is the effect of globalisation on climate commitment and performance moderated by domestic political institutions? The broader literature on the environmental consequences of globalisation studies the importance of institutional constraints and ideological heterogeneity among veto players, regime type, and political corruption. To answer the research question, this study applies these explanatory approaches to the analysis of climate commitment and performance. To formulate hypotheses on possible interaction effects between specific political institutions and globalisation, it is necessary to specify the causal order and interrelationship between domestic and international explanatory factors. Political-corruption and regime-type approaches, as well as, in part, the veto-player regime approach to state responses to globalisation, refer to multiple types of moderation effects. The literature discussion in Chapter 3 has identified four possible moderation effects. First, state responses to globalisation depend on domestic political institutions involved in the domestic political decision-making process. Second, domestic political factors involved in implementing climate policies influence the relationship between international integration and climate performance. Third, domestic political institutions affect a country's openness to international influences. Domestic political institutions, such as regime type, affect the government's exposure to international incentives and pressures. They are likely, therefore, to strengthen or weaken the incentives and pressures of international integration. Finally, political institutions moderate the effects of international economic integration on climate performance, as context factors of international trade and investment. To formulate hypotheses on moderation effects, it is necessary to specify the relationships between international and domestic factors that explain the three explanatory approaches. For instance, executive corruption may not simply affect a government's efforts to mitigate the negative consequences of economic globalisation, it may also affect climate outcomes, as a context factor in international trade and investment.

The previous chapter has explained the need to examine the effect of domestic political institutions on climate commitment and performance, on a disaggregated basis. This chapter argues that the same applies to the study of the interrelationship between domestic political institutions and globalisation. For instance, with regard to regime type, horizontal accountability has a direct effect on a government's response to globalisation. It refers to political institutions that are involved in the political decision-making process. By contrast, political and civil rights incentivise governments. They can only influence a country's responsiveness to international pressures. All democratic qualities can affect climate performance, as context factors of international trade and investment.

To specify the causal order of the explanatory factors, I refer to the explanatory model of cross-national variation in public policy proposed by Wenzelburger and Zohlnhöfer (2015). Section 5.1 explains the choice of this theoretical framework and Section 5.2 partly reformulates it, using it to analyse climate commitment and performance. Sections 5.3–5.5 specify, on this basis, explanatory models of the joint influence of veto players, political

corruption, and regime type. They formulate hypotheses that are tested in the following empirical analysis. Chapter 3 concluded that climate performance in developed countries depends on policy diffusion and that economic openness undermines climate commitment and climate change mitigation in developing countries. Chapter 3 also explained that international political integration is likely to contribute to climate commitment and performance. These sections examine whether domestic political institutional variables moderate these relationships.[52] The last section summarises the conclusions (5.6).

The central argument of this chapter is as follows: while there is little reason to expect institutional constraints and institutional quality to influence the relationship between economic interdependence and climate performance in developed countries, domestic political institutions are likely to moderate the effects of economic openness and international political integration on climate commitment and performance. This study argues that the veto-player approach cannot explain the relationship between globalisation and climate commitment and performance. Left- and right-wing veto players assess a country's international competitiveness. The importance of specific veto points, for the relationship between political globalisation and Kyoto Protocol ratification or the relationship between economic interdependence and climate outcomes in developed countries, is theoretically ambiguous. While corrupt and non-corrupt countries may react in similar ways to international pressures to stay competitive, political corruption is expected to worsen the negative growth effects of economic openness in the developing world. In contrast to previous studies, this research distinguishes between forms of political corruption. Finally, this chapter argues that regime type matters for the relationship between globalisation and climate commitment and climate performance. This study adds to the literature by explaining that, in contrast to the UNFCCC, there is no systemic difference between democracies and autocracies in the effect of political globalisation on the harder Kyoto Protocol or the effect of economic openness on climate performance. Together with political globalisation, political and civil rights should contribute to Kyoto Protocol ratification. It is an empirical question whether the negative effect of economic openness is stronger or weaker in developing countries with high levels of political and/or civil rights.

5.1 Selection of the theoretical framework

This chapter explains the use of Wenzelburger and Zohlnhöfer's (2015) explanatory model of cross-national variation in public policy as a theoretical framework. On this basis, the chapter develops explanatory models of the joint influence of globalisation and veto players, political corruption, and regime type. It then formulates hypotheses for the empirical analysis.

Most explanatory models of quantitative studies of globalisation and climate commitment and performance assume additive effects of international integration (see Chapter 3). This is in line with standard explanatory models of comparative foreign policy research and comparative policy research. Standard explanatory models of comparative public and foreign policy assume additive and independent effects of domestic and international determinants (e.g., Cohen, 2002, p. 433; Roller, 2005; Schmidt, 1993; Zohlnhöfer, 2008). They consider domestic and international determinants side-by-side in an integrated explanatory model of cross-national variation in (foreign) policy output. The literature review in Chapter 3 shows that most theoretical approaches to the policy consequences of international integration assume or acknowledge that domestic political factors (including domestic political institutions) moderate the effect of globalisation. Few existing theoretical approaches of foreign or domestic policy are able to consider the interrelationship between explanatory factors on different levels of analysis (Cohen, 2002, p. 433).

Qualitative research on the interrelationship between domestic and international explanatory factors of climate commitment (e.g., Harrison, 2000) refers to the two-levels game approach (Putnam, 1988). This liberal foreign-policy theory examines the relationship between international and domestic factors that explain government behaviour in international negotiations (Harnisch, 2013, p. 424). It distinguishes between two phases of the adoption of international agreements: the negotiation between national governments and the domestic adoption of the international treaty via the domestic ratification process. It regards international, political, and societal influences as incentives and constraints on government behaviour. In relation to international influences, it focuses on the behaviour of foreign governments, assuming that governments use domestic and international influences strategically to secure re-election. While the two-level games approach addresses the interrelationship between domestic and international explanatory factors, it cannot be applied to climate commitment and performance. First, it focuses on explaining the process of negotiating international agreements. This study focuses on cross-national variations in the ratification and implementation of international climate agreements. Second, it does not specify the interrelationship between international integration and domestic explanatory factors.

Wenzelburger and Zohlnhöfer (2015) have proposed a modified model of the explanatory model of cross-national variation in 'Heidelberg School' public policy, based on Zohlnhöfer (2005) (see Chapter 3), which addresses the interrelationship between domestic and international explanatory factors. They argue that the causal order of

[52] Nevertheless, the statistical analysis examines interaction effects between all domestic political institutional and international explanatory factors considered in this study.

factors that explain policy outputs must be specified to understand their interrelationship (Wenzelburger & Zohlnhöfer, 2015, p. 30). Accordingly, the explanatory model specifies the causal order of the explanatory factors of the 'Heidelberg School' (Wenzelburger & Zohlnhöfer, 2015, pp. 28ff.). Following Zohlnhöfer (2005) and veto player theory, they assume that political decision-makers (i.e., the government) are central to the adoption of policies (Wenzelburger & Zohlnhöfer, 2015, p. 28). Aspects of government are causally prior to other explanatory factors. Following Wenzelburger and Zohlnhöfer (2015, p. 28), theoretical approaches to comparative policy theory, they identify three characteristics of government as factors that explain cross-national variation in policy output: the partisan composition of the government (party-difference theory), the number and ideological heterogeneity of veto players (veto player theory) and the diffusion of policies and ideas (policy diffusion). Other domestic explanatory factors identified by comparative policy theories include context conditions, which influence government policy as incentives and pressures, i.e. they have no direct effect on policy output (Wenzelburger & Zohlnhöfer, 2015, p. 28f.). Globalisation and the socio-economic context are causally the furthest from policy outputs (Wenzelburger & Zohlnhöfer, 2015, p. 29). Thus, government responses to these context factors depend on aspects of the government and causally prior domestic-context factors (Wenzelburger & Zohlnhöfer, 2015, p. 29). International integration has no direct or independent effect on policy output (Wenzelburger & Zohlnhöfer, 2015, pp. 28f.). Its effect is moderated by the government and domestic context factors. The advantage of this explanatory model is that it describes the causal order of explanatory factors of cross-national variation in policy output, making it possible to specify the interrelationship between domestic and international factors. Second, its assumptions are in line with most theoretical approaches to the policy consequences of globalisation (see Chapter 3). Finally, the explanatory model of the 'Heidelberg School' can be complemented by other explanatory factors (Zohlnhöfer, 2013, p. 377).

In sum, the explanatory model developed by Wenzelburger and Zohlnhöfer (2015) makes it possible to specify the causal order of domestic political institutional and international explanatory factors of the three perspectives on the joint influence of domestic political institutions and globalisation.

5.2 Theoretical framework

This section partly reformulates the explanatory model and uses it to examine cross-national variations of climate commitment and performance. First, in contrast to Wenzelburger and Zohlnhöfer (2015), I do not regard policy diffusion as an aspect of the government. Second, the explanatory model does not consider policy outcomes (such as climate performance). Third, the theoretical framework of the 'Heidelberg School' does not address institutional quality in general or political corruption in particular. Wenzelburger and Zohlnhöfer's (2015) explanatory model was developed in the context of established democracies. The present study includes regime type. The reformulated explanatory model makes it possible to specify the causal order of domestic political institutional and international determinants of the three perspectives on the joint influence of domestic political institutions and globalisation and their interrelationship, thus helping to formulate hypotheses for the empirical analysis.

Following Wenzelburger and Zohlnhöfer (2015), this study assumes that the government is causally prior to other domestic and international explanatory factors. Governmental aspects, therefore, moderate the effect of international and domestic context factors on climate policy output. Veto player theory is used to identify political institutions that belong to the governmental system, i.e. that are involved in political decision-making processes. Veto players are defined as individual or collective actors, with the ability to block political decisions (see Chapter 4).[53] Following Fuchs (2000, pp. 32f.), I distinguish institutions within the governmental system from other political institutions. They are institutions with the function of vertical accountability (e.g. elections, political rights, the party system) or the relationship between citizens and the government (e.g., political and civil rights). These political institutions influence policy outputs indirectly, via the government system. They are context conditions of government behaviour.

Climate performance has been conceptualised as climate policy outcomes (see Chapter 2). In this respect, it is important to consider another category of political institutions: implementation or administrative institutions, i.e. political institutions that implement political decisions. These institutions have a direct impact on policy outcomes (e.g., climate performance). They have no effect on climate policy outputs (i.e. the ratification of climate treaties or the adoption of climate change mitigation policies).

In contrast to Wenzelburger and Zohlnhöfer (2015), this study considers regime type and political corruption. Both concepts refer to multiple categories of political institutions. Sections 5.5 and 5.6 specify the causal order of explanatory factors related to regime type and the political-corruption approach, discussing their interrelationship with international integration.

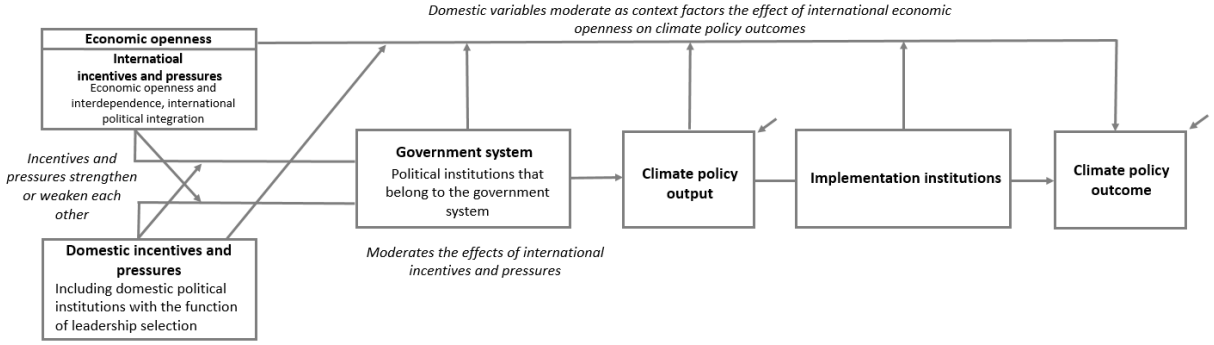
[53] Broader definitions of veto players include actors and institutions that cannot block political decisions but put pressure on political decision-makers (e.g., interest groups). For the present study, it is important to consider the causal order of explanatory factors. Relevant societal veto players are viewed as controls.

Following the discussion in the literature review (see Chapter 3), the present study focuses on the influence of international political integration, economic openness, and economic interdependence as relevant international explanatory factors. Wenzelburger and Zohlnhöfer (2015) focus on economic globalisation and EU integration. They do not explicitly refer to international political integration, understood as embeddedness in IGOs. While the present study does not focus on the effect of EU integration, it is a control variable (see Chapter 6). In accordance with Wenzelburger and Zohlnhöfer's (2015) explanatory model, international integration is seen as an external incentive and pressure on the government. This study does not consider policy diffusion to be an as aspect of the governmental system. In accordance with the policy-diffusion literature, economic interdependence constitutes an incentive or pressure on national governments to act in accordance with trading partners (see Chapter 3). Wenzelburger and Zohlnhöfer (2015) argue that globalisation is causally distant from policy outputs. The influence of international economic and political integration on climate commitment and performance is therefore affected by domestic-context factors and the government system.

The present explanatory model considers the four moderation effects identified in the discussion of the theoretical literature in Chapter 3. First, the government system moderates the effect of international incentives and pressures. It can act in accordance with them but does not necessarily do so. Second, domestic institutional context factors, i.e. domestic political institutions that are not part of the government system (domestic political institutions with the function of leadership selection) and international context factors are seen as incentives and pressures on government behaviour. They can strengthen or weaken each other. For instance, this assumption underpins the argument that democracies are more open to international influences. Third, country differences in implementation institutions can influence the effect of international integration on climate policy outcomes (climate performance). For instance, a failure to implement environmental regulations can moderate the effect of economic openness on climate performance via economic growth. So far, I have assumed, with Wenzelburger and Zohlnhöfer (2015), that international integration has no direct effect on climate commitment and performance. Following economic theory, economic openness affects climate performance via economic growth, independent of the government system (see Chapter 3). This relationship can be moderated by all kinds of political institutions, as context factors of international trade and investment.

Figure 5.1 summarises the explanatory model of cross-national variation in climate commitment and performance. As explained in Chapter 3, this study focuses on veto players, political corruption, and regime type as possible moderating factors. It does not consider all possible interrelationships between domestic and international explanatory factors.[54] Moreover, this study does not assume that political institutions and globalisation alone can explain cross-national variation in climate commitment and performance. Alternative explanations must be considered when analysing country differences in climate commitment and performance (Christoff & Eckersley, 2011, p. 444). Relevant control variables are addressed in Chapter 6. The following sections formulate hypotheses on the joint effect of domestic political institutions – veto players, dimensions of political corruption, and regime type – and globalisation on climate commitment and performance.

Figure 5.1 Explanatory model



[54] For instance, second-image theory assumes that international integration indirectly affects policy output, as the winners and losers of globalisation can influence climate policy outputs, via the regime type and vertical accountability. This causal pathway should be studied in future research.

5.3 The joint effects of veto points, policy preferences of veto players, and globalisation on climate commitment and performance

Following previous research on environmental and social policy (e.g., Cao & Prakash, 2012; Ha, 2012, 2008; Wenzelburger & Zohlnhöfer, 2015; Zohlnhöfer, 2005) (see Chapter 3), this chapter formulates hypotheses on the joint influence of domestic political institutions and globalisation on climate commitment and performance, from the perspective of veto player theory (Tsebelis, 2002). Based on the discussion of the literature on veto players and climate commitment and performance in Chapter 4, this chapter considers the ideological heterogeneity among veto players, specific veto points, and government ideology, as possible moderator variables. The following section specifies the causal position of these explanatory factors, vis-à-vis globalisation and climate commitment and performance (5.3.1). Section 5.3.2 formulates hypotheses on the possible interaction effects.

5.3.1 Specification of the explanatory model

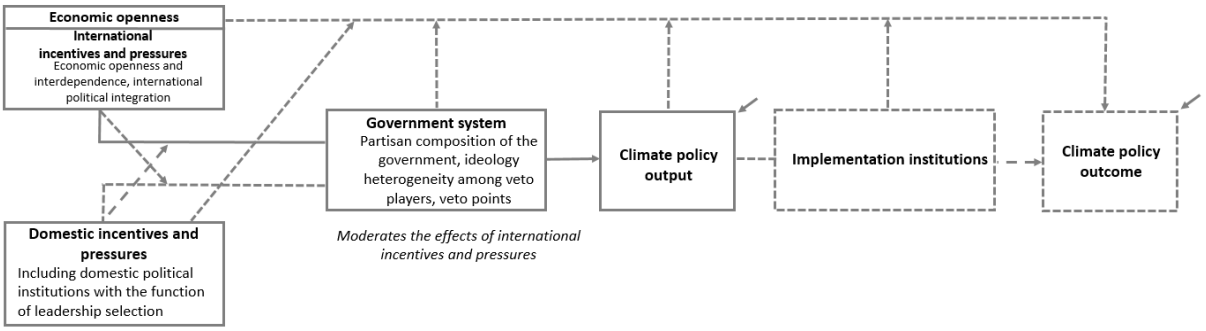
The most elaborate theoretical approach in veto player theory comes from Tsebelis (2002). In comparison to veto-point theory, it has the advantage of theorising the interaction between political institutions and political actors; this gives it a micro-foundation (Jahn, 2010, p. 47). In veto player theory, ideological distance among veto players is decisive. Given the available data, this study focuses in the left/right dimension (see Chapter 6). In relation to the ratification of international agreements, only the veto player who disagrees the most with the international treaty is crucial (Schulze, 2014, p. 119) (see Chapter 4).

Following the conclusion of Chapter 4, this study also examines possible joint effects of globalisation on specific veto points. Previous theoretical and empirical research has found no uniform effect of institutional veto points – bicameralism, presidentialism, and the number of government parties – on climate commitment and performance. As Chapter 4 explains, this study does not consider the effect of federalism separately from bicameralism. Second, previous research on state responses to globalisation from the perspective of veto player theory (e.g., Zohlnhöfer, 2005) has examined the joint effect of government ideology and globalisation, given that government parties are agenda setters in the political decision-making process. Government parties, especially in parliamentary systems, have the ability to make policy proposals that other veto players can either accept or decline (Tsebelis, 2002, p. 2, 62; Zohlnhöfer, 2005, p. 51). To consider this topic, this study applies partisan-difference theory, which suggests that the partisan composition of the government is decisive for climate commitment and performance (see Chapter 4, Schmidt, 1996, p. 155; Schmidt & Ostheim, 2007, p. 51).

The ideological heterogeneity of veto players, specific veto points, and government ideology refer to aspects of the governmental system. They therefore have a direct effect on the ratification of climate treaties and the adoption of climate change mitigation policies (climate policy output). They are causally prior to other domestic and international influences. This means that they moderate the effect of international economic and political integration on climate commitment and performance. In addition, the ideological heterogeneity of veto players, veto points, and the partisan composition of the government can affect the relationship between economic openness and climate performance via economic growth, as context factors of international trade and investment. For instance, they affect a country's attractiveness for foreign investment (see Section 5.3.4). Figure 5.2 presents the joint influence of veto players and globalisation on climate policy outputs and climate policy outcomes.

To conclude, this study examines, from the perspective of veto player theory, whether ideological heterogeneity among veto players, government ideology, and specific institutional veto points moderate the effect of international integration on climate commitment and performance.

Figure 5.2 Veto players, veto points, and climate commitment and performance



Notes: Dashed lines refer to effects that are not considered in the original veto-player approach to state responses to globalisation. This study does not examine that climate policy outputs might moderate as context conditions of international trade and investment the effect of economic openness on climate policy outcomes.

5.3.2 Ideological heterogeneity of veto players and government ideology

This section argues that the policy preferences of veto players in the left/right dimension make no difference to the effect of international economic and political integration on climate commitment and performance.

International economic integration
This study assumes no effect of the presence of a right-wing veto player, ideological heterogeneity among veto players in the left/right dimension, or international economic integration (economic openness or policy diffusion) on Kyoto Protocol ratification and climate performance. Following Cao and Prakash (2012, p. 69, footnote) right-wing governments with few veto players are most likely to act in accordance with trade-competition pressures, in contrast to left/green governments with few veto players. However, left- and right-wing parties both care about international competitiveness and have no clear positions on climate change mitigation (see Chapter 4). This study, therefore, assumes no effect of the presence of a right-wing veto player on Kyoto Protocol ratification, or of ideological distance on climate performance. The absence of a right-wing veto player enabled Chrétien in Canada to ratify the Kyoto Protocol. By contrast, the Clinton administration was aware that the Kyoto Protocol would never be ratified by Congress; it never intended to start the ratification process. This enabled it to support international climate cooperation during and after negotiations of the Kyoto Protocol, irrespective of international competitiveness concerns. Apart from the absence of right-wing veto players, competition concerns did not apply to the red-green government in Germany or the Labour government in the United Kingdom, as the business-as-usual development of their greenhouse gas emissions enabled them to accept their emissions reduction targets. Accordingly, no difference in the effect of international economic integration on Kyoto Protocol ratification and climate performance is expected in countries with left- or right-wing government ideologies.
The present study also expects no moderation effect of government ideology in the left/right dimension (or the presence of a right-wing veto player) on the effect of international economic integration on UNFCCC ratification. International competition concerns are of less importance for UNFCCC ratification, which does not involve significant costs. Thus, left- and right-wing veto players do not affect the relationship between international economic integration and UNFCCC ratification.

International political integration
As left-wing parties are more open to international cooperation, right-wing government ideology (or the presence of a right-wing veto player) can weaken the positive effect of international political integration on UNFCCC and Kyoto Protocol ratification and climate performance (see Chapter 4). However, as it does not cost much to ratify the former, the effect of international political integration is unlikely to differ in countries that do or do not have right-wing veto players. In fact, most developed countries that are, in worldwide comparisons, highly involved in IGOs, ratified the UNFCCC quickly, independent of government ideology or the presence of a right-wing veto player. Is the effect of international political integration on Kyoto Protocol ratification and climate performance stronger in countries with left-wing government ideology or no right-wing veto player? As previously explained, in developed countries, support for the Kyoto Protocol among left-wing veto players has varied with the greenhouse gas emissions targets. Left-wing veto players in developing countries may be more inclined to ratify the Kyoto Protocol than their right-wing counterparts because they are more open to international support for sustainable development. Simultaneously, a right-wing veto player may also accept international support for climate change mitigation.
To conclude, this study assumes that policy preferences in the left/right dimension cannot explain state responses to economic and political globalisation.

5.3.3 Veto points

While there may be no joint effect of the policy preferences of veto players in the left/right dimension and globalisation on UNFCCC and Kyoto Protocol ratification and climate performance, veto points can moderate the effect of globalisation. As explained in Chapter 4, veto points either support or undermine climate commitment and performance. Accordingly, institutional constraints may strengthen or weaken the effects of economic and political globalisation. The effects of international economic and political integration on climate commitment and performance may be stronger in countries with few government parties, no bicameralism, and no presidential veto player. It is easier for such countries to act in accordance with international economic or political incentives or to resist international pressures. With regard to the positive effect of international political integration, more veto points also imply that diffuse interests are better represented in the political system. However, the negative effects of international economic integration may be stronger and the positive effects of political integration weaker on climate commitment and performance in countries with high levels of government fragmentation, bicameral systems, or presidential systems. A single opponent of climate protection who acts in accordance with international economic pressures or against international political incentives may prevent the ratification of the climate treaties and the adoption of climate change mitigation policies. Competition concerns blocked the ratification of the Kyoto

Protocol by the US Congress. Canadian provinces that expected to lose from climate change mitigation blocked climate change mitigation policies.

With regard to climate performance, an additional argument suggests that the effect of economic openness varies with government fragmentation, the presence of a president, and/or bicameralism. Veto points are a context factor in international trade and investment. The literature on the determinants of foreign direct investment examines whether veto points help a country attract international trade and investment (e.g., Ahlquist, 2006, p. 689; Henisz, 2002; Henisz, 2000, p. 338f.; Jensen, 2003, pp. 594f.; Li & Resnick, 2003, pp. 186f.). This literature discusses whether a low or high number of veto points is attractive for international trade and investment.

In sum, it is theoretically unclear whether veto points contribute to a stronger or weaker effect of international economic integration on climate performance. Chapter 4 has shown that no uniform effect of specific veto points on climate commitment and performance can be assumed. This chapter argues that the same applies to the joint effect of specific veto points and globalisation.

Chapter 4 has shown that the relationship between government fragmentation and climate commitment and performance is ambiguous, from a theoretical perspective. It is also not clear whether the number of government parties affects state responses to globalisation. The number of veto points may hinder or support the effect of international incentives and pressures (see above). In addition, government fragmentation is associated with the accountability of political parties (see Chapter 4). When a larger number of government parties implies lower accountability for individual government parties, this may support a country's ability to act in accordance with economic pressures. Simultaneously, it may weaken the effect of positive incentives related to international political integration. However, as Chapter 4 explained, it is unclear, from a theoretical perspective, whether more government parties implies lower levels of accountability. In sum, it is unclear whether government fragmentation strengthens or weakens the negative effects of international economic integration on climate performance and the positive effects of political globalisation on climate commitment and performance.

With regard to the joint effect of globalisation and bicameralism on climate commitment and performance, the conclusion of the literature review in Chapter 4 should be considered. The effect of bicameralism depends on whether supporters or opponents are in power; it also reflects the division of responsibility and costs between the federal and state levels. While the Australian upper chamber enabled Greens to influence climate change mitigation policy, the US Congress opposed the ratification of climate treaties and the introduction of climate change mitigation policies, among others, because of international competitiveness concerns. Thus, there may be no general moderation effect of bicameralism on the relationship between international economic integration and climate commitment and performance – or on the relationship between international political integration and climate commitment.

In this developed-country sample, only the United States has had a presidential veto player during the research period. For this reason, no interaction effects between presidentialism and international integration in developed countries could be formulated. Scholars do not agree on whether parliamentary or presidential systems are more likely to consider diffuse interests, such as climate change protection, and are willing to introduce climate policies despite economic pressures and the lower negative scale effects of economic openness (see Chapter 4). Thus, it is theoretically unclear whether a presidential veto-player moderates the effects of economic and political globalisation. With regard to economic openness and climate performance, the literature also discusses whether parliamentary or presidential systems are more open to international trade and investment. This can affect climate performance, via scale effects. Presidential systems may be more open to trade, leading to higher negative scale effects of economic openness on climate performance. By contrast, Persson and Tabellini (2006, p. 322) have argued that parliamentary democracies are more likely to adopt liberal trade policies, i.e. to liberalise trade, because they consider the policy preferences of more voters. To conclude, whether presidential and non-presidential democracies vary in the effect of international economic integration on Kyoto Protocol ratification and performance is an empirical question.

To conclude, the moderation effects of veto points on the relationship between globalisation and climate commitment and performance may vary between specific veto points. No interaction effect of international economic integration – openness and policy diffusion – is expected with government fragmentation, a presidential veto player, or bicameralism on UNFCCC and Kyoto Protocol ratification. Chapters 2 and 3 conclude that there is no general effect of economic globalisation on UNFCCC or Kyoto Protocol ratification. With regard to economic globalisation and the Kyoto Protocol, competition concerns regarding the Kyoto Protocol varied among developed countries. It does not cost any country much to ratify the UNFCCC. For this reason, there are no interaction effects of veto points and international political integration on participation in the UNFCCC.

5.3.4 Conclusions

This study assumes that government ideology and ideological heterogeneity in the left/right dimension do not influence the relationship between globalisation and climate commitment and performance. Left- and right-wing parties care about the competitiveness of the domestic economy. It is theoretically unclear whether specific veto

points strengthen or weaken the effects of international economic and political integration on Kyoto Protocol ratification and performance. Specific veto points and their interaction with globalisation should be examined separately. The reason for this is that moderator effects can vary between specific veto points. No interaction between veto points and international economic integration on UNFCCC and Kyoto Protocol ratification is expected, as there is no clear effect of economic globalisation on climate commitment. $H_{xveto}1$–14 formulate competing hypotheses regarding the joint effects of globalisation and the policy preferences of veto players on Kyoto Protocol ratification and climate performance. As no effect of economic openness in developed countries is expected, these hypotheses refer only to interactions developing countries. For the same reasons, hypotheses on the interaction between veto players and policy diffusion (economic interdependence) refer only to developed countries. Table 5.1 summarises the hypotheses on the joint effects of globalisation with government ideology and veto players.

Table 5.1 Veto players, globalisation, and climate commitment and performance

$H_{xveto}1$	The positive effect of international political integration on Kyoto Protocol ratification should be stronger in countries with higher levels of government fragmentation.
$H_{xveto}2$	The positive effect of international political integration on Kyoto Protocol ratification should be weaker in countries with higher levels of government fragmentation.
$H_{xveto}3$	The positive effect of international political integration on Kyoto Protocol ratification should be stronger in presidential democracies.
$H_{xveto}4$	The positive effect of international political integration on Kyoto Protocol ratification should be weaker in presidential democracies.
$H_{xveto}5$	The positive effect of international political integration on Kyoto Protocol ratification should be stronger in bicameral democracies.
$H_{xveto}6$	The positive effect of international political integration on Kyoto Protocol ratification should be weaker in bicameral democracies.
$H_{xveto}7$	The negative effect of economic openness on climate performance should be stronger in developing countries with higher levels of government fragmentation.
$H_{xveto}8$	The negative effect of economic openness on climate performance should be weaker in developing countries with higher levels of government fragmentation.
$H_{xveto}9$	The negative effect of economic openness on climate performance should be stronger in presidential developing democracies.
$H_{xveto}10$	The negative effect of economic openness on climate performance should be weaker in presidential developing democracies.
$H_{xveto}11$	The negative effect of policy diffusion on climate performance should be stronger in developed countries with higher levels of government fragmentation.
$H_{xveto}12$	The negative effect of policy diffusion on climate performance should be weaker in developed countries with higher levels of government fragmentation.
$H_{xveto}13$	The negative effect of policy diffusion on climate performance should be stronger in bicameral developed countries.
$H_{xveto}14$	The negative effect of policy diffusion on climate performance should be weaker in bicameral developed countries.

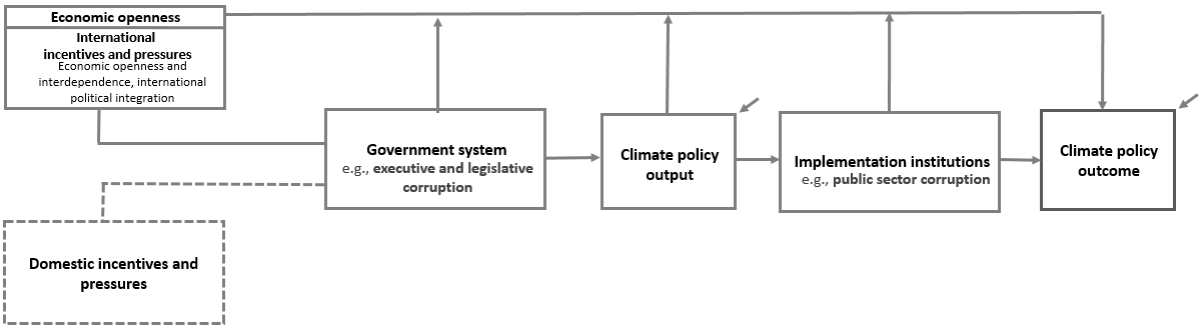
5.4 The joint effects of political corruption and globalisation on climate commitment and performance

Previous research indicates that political corruption worsens the negative impact of economic openness on climate performance (see Chapter 3). In contrast to the existing literature, this section discusses multiple dimensions of globalisation. Based on the conclusions in Chapter 4, it also includes a separate discussion of forms of political corruption and examines both climate commitment and performance. Executive, legislative, and public sector corruption are expected to strengthen the negative effects of economic openness on climate performance in developing countries. This chapter begins by specifying the explanatory model. Next, it discusses the joint impact of globalisation and political-corruption dimensions on climate commitment and performance. Finally, it presents conclusions.

5.4.1 Specification of the explanatory model

Political corruption has been defined as the misuse of public office for private gains by political decision-makers and public officials (see Chapter 4). The literature review recommends distinguishing between corruption among political decision-makers and public-sector officials (see Chapter 4). The data from McMann et al. (2016) enables this study to differentiate between executive, legislative, and public sector corruption.[55] The conceptualisation of political corruption on different levels of the political system makes it possible to consider the causal order of explanatory factors in the analysis of interaction effects (see Figure 5.3). Executive and legislative corruption have a direct effect on climate policy output (e.g., climate commitment) because they refer to characteristics of the governmental system. They can make a difference to government responses to globalisation. Public sector corruption has no direct effect on climate output (including climate commitment). It directly affects climate policy outcome (including climate performance) because it undermines the implementation of climate policies. Executive, legislative, and public-sector corruption influence the effects of economic openness on climate performance via economic growth. They are context conditions of international trade and investment.
Public sector corruption can also influence the behaviour of political decision-makers as a context factor (see Chapter 4). This assumption underlies the argument that governments that are aware of high levels of public sector corruption may be less likely to pursue ambitious climate policies (see Chapter 4). Climate commitment is, however, understood here to be the ratification of international climate treaties. For this reason, public sector corruption is not considered in this analysis of climate commitment.

Figure 5.3 Political corruption, globalisation, and climate commitment and performance



Notes: The main argument of this figure is displayed by solid lines.

5.4.2 Executive, legislative, and public sector corruption

The following section formulates hypotheses on the joint effect of globalisation – economic and political globalisation – and political-corruption dimensions.

International economic integration
As Chapter 3 has explained, economists expect the effect of economic openness on climate performance to be stronger in corrupt countries (e.g., Chang, 2015; Cole, 2007; Damania et al., 2003). The influence of polluters is stronger on corrupt members of government and parliament (see Figure 5.4), who tend to be more open to business interests in exchange for bribes; they have little interest in adopting or implementing climate-protection policies. The negative effect of economic openness on climate performance is higher in countries with high levels of public sector corruption. Public sector corruption undermines the monitoring and implementation of environmental regulations because it enables domestic and international firms to bribe public-sector officials. In sum, the negative

[55] This study does not consider judicial corruption.

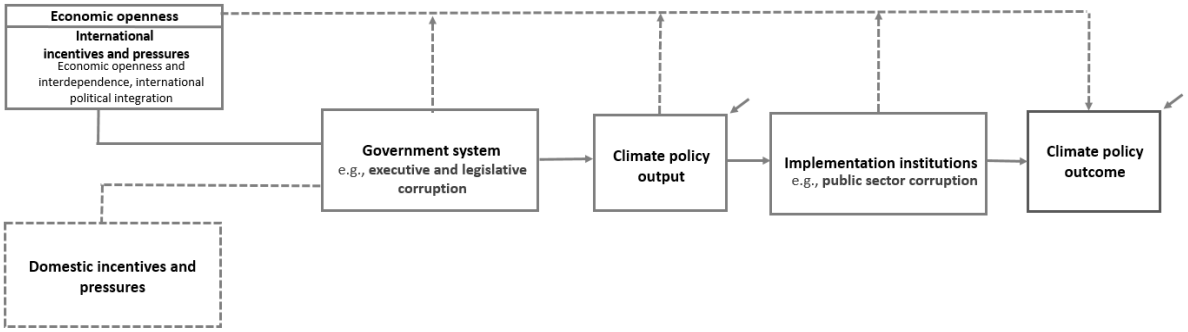
effects of trade and capital openness on climate performance are likely to be higher in countries with high levels of executive, legislative, or public sector corruption.

Political corruption makes a country less attractive for international investment (see Figure 5.5). Bribes imply higher costs for investors and uncertainty about the future behaviour of governments and public officials (Biglaiser & DeRouen, 2006, p. 53; Biglaiser & Staats, 2010, p. 510). The economic literature suggests that FDI inflows are lower in corrupt countries (e.g., Fredriksson et al., 2003; Peres et al., 2018). Thus, political corruption may be associated with lower CO_2 emissions, via lower scale effects of economic growth. From this perspective, trade and capital openness are likely to undermine climate performance in countries with higher levels of executive, legislative, and/or public sector corruption.

To conclude, forms of political corruption are likely to moderate the effect of economic openness in developing countries. The direction of the interaction effect is an empirical question. This study assumes no joint effect of economic openness and political corruption in developed countries. As Chapter 3, has explained, no effect of economic openness in rich countries is expected. Chapters 2 and 3 argue that there is no effect of economic globalisation on climate commitment. Likewise, there are expected to be no interaction effects with executive or legislative corruption on UNFCCC or Kyoto Protocol ratification.

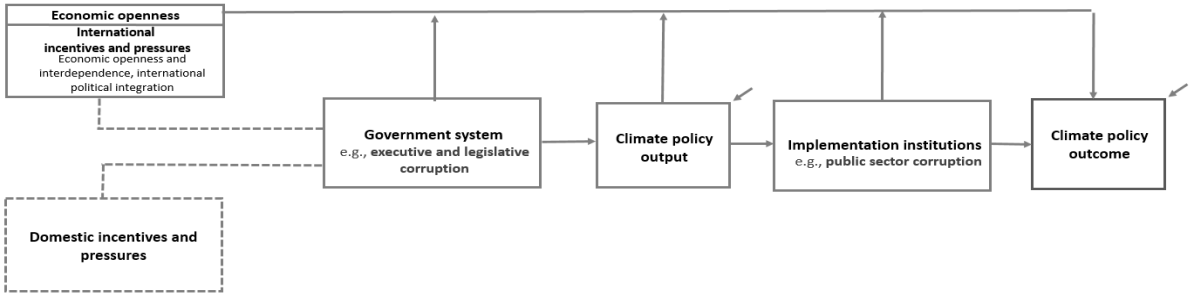
Chapter 3 argues that international economic integration affects climate performance in developed countries via policy diffusion. Executive and legislative corruption may strengthen this effect on climate performance in developed countries. Corrupt members of government and parliament may be less open to other policy preferences, such as climate protection. To ensure economic competitiveness, governments may undermine the implementation of environmental regulations and public-sector officials may accept bribes. Thus, the effect of policy diffusion may be stronger in countries with higher levels of executive, legislative, and/or public sector corruption.

Figure 5.4 Political corruption dimensions, globalisation, and climate commitment and performance



Notes: The main argument of this figure is displayed by solid lines.

Figure 5.5 Political corruption dimensions, globalisation, and climate performance



Notes: The main argument of this figure is displayed by solid lines.

However, both corrupt and non-corrupt governments consider the international competitiveness of their domestic economies. Thus, no interaction effects are expected between political-corruption dimensions and policy diffusion on climate performance.

International political integration

The literature has not addressed the relationship between political globalisation and political corruption. Based on the corruption/environment literature (see Chapter 4), corruption leads politicians to focus more on their own self-interest than on generalised interests. Thus, they may be less open to positive incentives of international political integration, declining to ratify climate agreements quickly or to adopt and implement climate change mitigation policies. With regard to climate commitment, countries with corrupt governments and parliaments are more likely to ratify climate treaties fast. Corrupt countries may participate in international cooperation to enhance their international reputations. Thus, involvement and centrality in IGO networks may contribute to climate-treaty

ratification, especially in corrupt countries. This is particularly relevant to soft climate treaties, such as the UNFCCC. Overall, political corruption may strengthen or weaken the positive incentives derived from international political integration. These effects can balance each other out. Executive and legislative corruption are thus not expected to influence the positive effect of international political integration on climate commitment and performance.

5.4.3 Conclusions

The political-corruption approach makes an important contribution to our understanding of the relationship between economic openness and climate performance in developing countries. Political corruption is likely to moderate the effect of economic openness on climate performance in developing countries (see Table 5.2). The direction of the effect on climate performance is an empirical question. To ascertain whether specific forms of political corruption are decisive, executive, legislative, and public sector corruption are examined separately.

Table 5.2 Political corruption, globalisation, and climate commitment and performance

$H_{xcorr}1a$	The negative effect of economic openness on climate performance should be higher in developing countries with higher levels of executive/legislative/public sector corruption.
$H_{xcorr}1b$	The negative effect of economic openness on climate performance should be higher in developing countries with lower levels of executive/legislative/public sector corruption.

5.5 Joint effect of regime type and globalisation on climate commitment and performance

The regime-type approach to the policy consequences of globalisation assumes that democracies and autocracies differ in their responses to international integration (see Chapter 3). As all developed countries are democracies, and as democracy-quality indicators do not vary significantly, this approach has been applied only to developing countries (analysis of climate commitment and performance) and the pooled sample (analysis of climate commitment). As explained in Chapter 3, Spilker (2013) finds no joint effect of regime type and trade openness on CO_2 emissions in developing countries. To date, no studies have investigated climate commitment. The present study examines the effect of specific democratic qualities on the relationship between globalisation and climate commitment and performance, in addition to regime-type differences, based on the conclusions in Chapter 4. Chapter 4 shows that, while there may be a systemic difference in the ratification of the UNFCCC between democracies and autocracies, no uniform effect of democratic qualities – vertical or horizontal, political and civil rights – on Kyoto Protocol ratification and climate performance can be assumed. Moreover, the present study considers economic and political globalisation.

This chapter argues that there is likely to be a systemic difference between democracies and autocracies in the effect of political globalisation on UNFCCC ratification. In contrast to previous research (e.g., Ruoff, 2009), it explains that it is unclear, from a theoretical perspective, whether international political integration contributes more to UNFCCC ratification in democracies or autocracies. While democracies may be more open to international cooperation, autocracies can ratify the UNFCCC fast to enhance their international reputations. With regard to the Kyoto Protocol and climate performance, only specific democratic qualities, such as political and civil rights, are likely to moderate the effect of political and economic globalisation. Unlike the UNFCCC, the Kyoto Protocol has been contested by both developed and developing countries. Political and civil rights may strengthen the positive effects of international political integration on Kyoto Protocol ratification. Political rights enable ENGOs to pressure governments to act in accordance with international incentives. Countries that accept the rule of law may be more open to climate cooperation. Political and civil rights also moderate the effect of trade and capital openness on climate performance in developing countries. On the one, hand political and civil rights can weaken the negative effects of economic openness; on the other hand, they can contribute to global air pollution by making a country more attractive for international trade and investment. This chapter begins by specifying the explanatory model used to consider democracy-quality dimensions. The second section discusses the interrelationship between regime-type characteristics and globalisation. The last section summarises the hypotheses.

5.5.1 Specification of the explanatory model

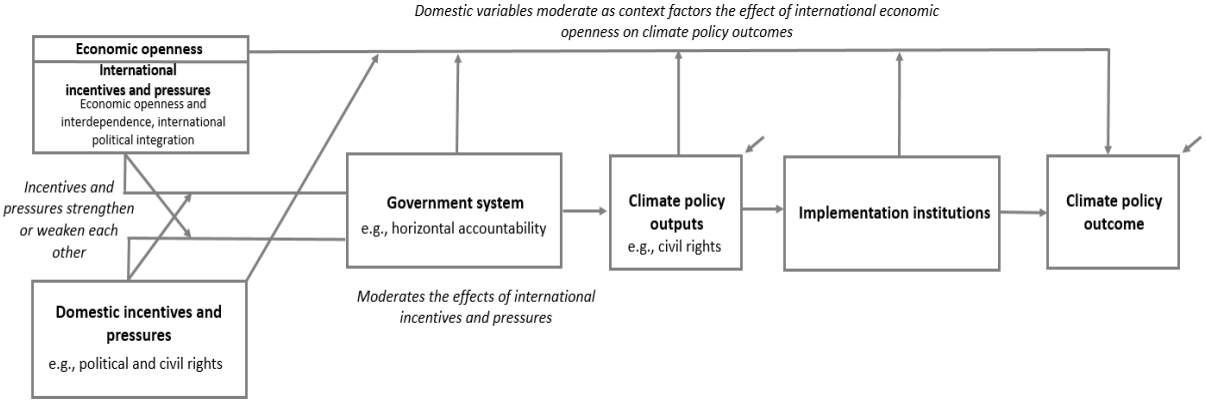
The literature on the joint effect of regime type and globalisation assumes that governments in democracies and autocracies react in different ways to international integration. Accordingly, the following section begins by formulating hypotheses on the joint effect of regime type and international integration on climate commitment and performance. The academic literature suggests that democracies are more open than autocracies to international

influences. As Chapter 4 makes clear, in contrast to UNFCCC ratification, no uniform effect of vertical and horizontal accountability or political and civil rights on Kyoto Protocol ratification and climate performance can be assumed. For this reason, the interaction effects between institutional aspects of democracy and globalisation are examined separately. Regime type includes characteristics of various categories of political institutions, relative to its causal position vis-à-vis policy outputs. To formulate hypotheses on moderation effects with international integration, the explanatory model must specify the position of the democracy-quality dimensions, relative to other determinants (see Figure 5.6).

As Chapter 4 has explained, this study distinguishes between four democracy-quality dimensions: electoral and horizontal accountability and political and civil rights. Horizontal accountability, i.e. checks and balances, refers to an aspect of the government system. In fact, it partly overlaps with the veto-player approach, which also examines institutional constraints on government. Accordingly, checks and balances have a direct effect on the ratification of climate treaties and the adoption of climate change mitigation policies. It moderates government responses to domestic and international influences. Its effect on climate performance is moderated by implementation institutions. Vertical accountability, political rights, and civil rights have an indirect effect on climate policy output via the governmental system. Vertical accountability influences which actors have access to the governmental system. Political and civil rights are the institutional context of citizens and interest groups, which pressure the government to consider their climate-policy preferences. In terms of their interplay with globalisation, this means that they (as an incentive to government behaviour) may strengthen or weaken the effect of international incentives and pressures on the ratification of climate treaties and the adoption of climate policies. For instance, political rights may enable public support for climate cooperation. This could make a government open to international incentives decide to join international climate cooperation.

Vertical and horizontal accountability, as well as political and civil rights, also have an effect on climate policy outcomes, independent of climate policy output. They influence the behaviour of citizens and firms. Thus, they can moderate the scale effects of economic openness on climate policy outcomes. The following sections formulate hypotheses on possible moderation effects of regime type, democracy-quality dimensions, and international integration.

Figure 5.6 Democracy-quality dimensions, globalisation, and climate commitment and performance



5.5.2 Regime type

International economic integration

The International Relations literature assumes that international economic integration contributes to international cooperation (see Chapter 3). International Political Economy research suggests that democratic developing countries are more open to trade and foreign capital (Jakobsen & de Soysa 2006, p. 388; Milner & Kubota, 2005). The reason is that they have abundant labour, i.e. workers, who profit from trade and investment and have more influence over the democratic political decision-making process than workers would have in autocracies. By contrast, capital owners stand to lose from economic openness because it undermines their monopolistic position in the domestic economy; they have more control over the political decision-making process in autocratic developing countries. Thus, the positive incentives of trade and capital openness to ratify international climate agreements are more prevalent in democracies than in autocracies. The assumption that democracies are more open to international trade and investment is contested (e.g., Persson & Tabellini, 2006, p. 321). Moreover, the Chapter 3 discussion of the globalisation/environmental literature expected no overall effect of economic openness in developed countries and a negative effect on climate performance in developing countries.

As economic openness implies an exposure to the pressure to stay economically competitive, the negative effect of trade and foreign investment could be stronger in developing democracies than in autocracies. Presumably, both democratic and non-democratic governments consider the competitiveness of their economies in order to stay in

power. Therefore, no joint effect of regime type and economic openness is expected because of pressures to stay competitive. For the same reason, this study assumes no joint effect of regime type and economic interdependence on climate commitment and performance (see also Cao & Prakash, 2012, p. 6 with regard to domestic pollution). There may, however, be a joint effect of regime type and economic openness on climate performance via economic growth. International trade and investment contribute to CO_2 emissions via economic growth (see Chapter 3). The regime type is a context factor in the behaviour of firms. Economists and political scientists often discuss whether democracies or autocracies are more attractive for foreign investors (Desbordes & Verardi, 2017, p. 43; Li & Resnick, 2003, p. 176; Li et al., 2018). Attractiveness to foreign capital may undermine climate performance via scale effects of economic growth. On the one hand, democracies are expected to attract FDI because vertical accountability, horizontal accountability, political rights (e.g., media freedom), and civil rights (e.g., property rights) reduce uncertainty and expropriation risk, contribute to political stability, and enable long-term investments (Ahlquist, 2006, p. 689; Choi & Samy, 2008; Desbordes & Verardi, 2017, p. 43; Feng, 2001; Jensen, 2003, pp. 594f.; Li & Resnick, 2003, p. 176; Olson, 1993, p. 573; Pastor & Hilt, 1993, p. 492; Pastor & Sung, 1995, p. 226). On the other hand, autocracies may be more attractive to multinational enterprises, given that horizontal accountability can hinder policy reform, vertical accountability can lead to policies that harm foreign investment (i.e. protection of domestic firms and adoption of social policies) and political rights, such as media freedom, may prevent deals between multinational corporations and government officials (Biglaiser & Staats, 2010, p. 510; Desbordes & Verardi, 2017, pp. 43f.; Haggard, 1990, pp. 258f.; Li & Resnick, 2003, p. 176; O'Donnell, 1978; Oneal, 1994, p. 567). Harms and Ursprung (2002) conclude that the theoretical literature is ambiguous. Li and Resnick (2003) argue that democracy has positive and negative effects on FDI. Biglaiser and DeRouen (2006) note that democracies and autocracies do not differ in their attractiveness to foreign capital. The empirical research is ambiguous. In a recent study, Desbordes and Verardi (2017) have found that democracy contributes to FDI. Thus, no joint effect of democracy and capital openness on climate performance is expected. 'Democracy by itself, does not necessarily support greater profit opportunities or reduce risk' (Biglaiser & Staats, 2010, p. 518). As the following sections will argue, specific traits of democracy can make a country attractive to international trade and foreign investors.

International political integration

The International Relations literature suggests that democracies are more cooperative, at the international level, than their autocratic counterparts (see Chapter 4). Thus, democratic countries involved in IGOs tend to be more exposed and open to the positive effects of international political integration on climate commitment and performance (Payne, 1995, p. 48; Ruoff, 2009; Spilker, 2012). Similarly, the democracy/environment literatures assume that democracies are more environmentally friendly because they are, in general, more cooperative at the international level (e.g., Midlarsky, 1998, pp. 345f.). Following Midlarsky (1998, p. 346) the arguments that link democracy to peace – citing mutual identification among democracies, cooperation among countries, and representative institutions – also apply to environmental protection. Learning from other democracies via international cooperation also contributes to environmental protection (Midlarsky, 2001, p. 161; Midlarsky, 1998, p. 346). In sum, the literature suggests that the positive effect of international political integration on climate protection is stronger in democracies than in autocracies. As Chapter 4 explains, this study assumes that regime type matters only for UNFCCC ratification (vs. Kyoto Protocol ratification and climate performance).

Based on the literature on autocracies and the ratification of human-rights treaties, autocracies embedded in the international political system are more likely to ratify soft climate treaties (e.g., the UNFCCC). Hafner-Burton and Tsutsui (2005) have argued, drawing on world society theory, that states which lack the willingness or ability to protect human rights do ratify human-rights treaties to gain legitimacy in international society. This is especially true in the case of international treaties that lack enforcement mechanisms; as these are ratified by many states, it is easy to identify as deviants states that are not signatories. World society theory suggests that legitimacy becomes more important when a country is integrated into international society (Hafner-Burton & Tsutsui, 2005, p. 1382). Thus, autocracies that are well-integrated into the international political system are more likely to ratify the UNFCCC to enhance their international reputations. To conclude, regime type matters to the relationship between IGO involvement and the ratification of soft international climate treaties, such as the UNFCCC. Whether the positive effect of political integration is stronger in democracies or autocracies is an empirical question.

To conclude, this study assumes that regime type and international political integration together influence the ratification of the UNFCCC. It is an empirical question whether democracies or autocracies involved with IGOs are more likely to ratify the UNFCCC. On the one hand, democracies are more open to participating in soft international agreements. On the other hand, autocracies that participate in international initiatives tend to ratify soft international treaties to enhance their international reputations. No general difference between democracies and autocracies, regarding the effect of economic openness and interdependence on climate commitment and performance, is expected.

5.5.3 Vertical accountability

The theoretical discussion shows that no effect of competitive elections on climate commitment and performance can be expected. The effect depends on whether supporters or opponents of climate protection are elected. Accordingly, competitive elections alone make no difference to the relationship between international economic and political integration and climate commitment and performance.
As detailed above, some scholars believe that vertical accountability incentivises foreign capital because it reduces political uncertainty (such governments are more likely to keep their commitments to ensure re-election) (e.g., Jensen, 2003). It has also been argued that democracies are better at implementing necessary policy measures to ensure economic growth because they enjoy higher levels of public acceptance through being elected (Pastor & Hilt 1993, p. 492). However, other explanatory factors have been found to be more important (e.g., Biglaiser & Staats, 2010).
To conclude, this study assumes no joint influence of vertical accountability and international political or economic integration on climate commitment and performance.

5.5.4 Horizontal accountability

The discussion about checks and balances and climate commitment and performance is linked to the debate on veto players and climate protection. While horizontal accountability can strengthen the positive effects and lessen the negative effects of international political and economic integration by considering a range of policy preferences, a single veto player opposed to climate cooperation and protection can delay the process of ratifying the UNFCCC and Kyoto Protocol and hinder the adoption and implementation of climate policies. In addition, no uniform interaction effects of specific veto points are expected, alongside international political and economic integration on climate commitment and performance. In this respect, no interaction effects on climate commitment and performance can be assumed between horizontal accountability and international economic and political integration.
Chapter 3 expected to find a negative effect of economic openness on climate performance in developing countries via scale and composition effects. Checks and balances are beneficial for economic growth because they enable long-term investments by domestic and international firms (e.g., Henisz, 2002; Henisz, 2000, p. 338f.). Horizontal accountability is also attractive to foreign capital because it contributes to political stability and reduces the risk of expropriation (Ahlquist, 2006, p. 689; Jensen, 2003, pp. 594f.; Li & Resnick, 2003, pp. 186f.). The negative effects of trade and investment may, therefore, be stronger in developing countries with high values of horizontal accountability. However, other institutional traits of democracy have been found to have more impact on the decisions of foreign investors (Biglaiser & Staats, 2010).
In sum, no interaction effect is expected between horizontal accountability and international political or economic integration, on either climate commitment or climate performance.

5.5.5 Political rights

The positive effect of international political integration may be more prevalent in countries with freedoms of expression, association, media, and an independent civil society. Both international political integration and political rights are here regarded as incentives, encouraging governments to join international climate cooperation (see Chapters 3 & 4). As Chapter 3 explains, constructivist and world-society theorists assume that domestic political institutions can strengthen or weaken international influences because they affect a country's responsiveness. In this respect, ecological-modernisation theory assumes that political and civil rights reflect 'a country's institutional reflexivity and receptivity to environmental reform' (Zahran et al., 2007, p. 43). They therefore make a country more likely to consider environmental protection (Leroy & van Tatenhove, 2000, pp. 196f., 200; Zahran et al., 2007, pp. 41, 43). In addition, domestic interest groups can use international cooperation to enforce their climate-policy preferences by demanding the ratification of international agreements (Payne, 1995, p. 47). This interaction effect is likely to be weaker in relation to climate performance than commitment. It is more difficult for domestic groups and foreign countries to monitor the implementation of climate-policy goals than the ratification of climate treaties. Governments may not act in accordance with international incentives involving international political integration. In sum, the positive effect of international political integration on climate commitment is likely to be stronger in countries with more political rights.
The negative effects of economic openness and interdependence on climate commitment and performance may be weaker in countries with more political rights. This is a positive incentive, encouraging governments to ratify international climate agreements, despite concerns about economic competitiveness. For instance, in the developed world, public support contributed to Kyoto Protocol ratification despite competition concerns. Public support of the Kyoto Protocol was important for EU ratification. The Japanese government ratified the Kyoto Protocol, despite fears that it would lose economic competitiveness, because of public pressure to ratify the international treaty named for a Japanese city. However, as competition concerns vary across developed countries, no general

interaction effect on the Kyoto Protocol can be assumed. In addition, chapter 3 concluded that economic openness should not undermine climate commitment. This interaction effect might also not apply to climate performance because issue visibility is higher for the ratification of international treaties than for their implementation. Moreover, climate change mitigation is associated with considerable costs.

Political rights, however, can moderate the effect of economic openness on climate performance via economic growth. On the one hand, the negative scale effects of trade and investment on climate performance may be less prevalent in countries with high-level political rights because they enable local communities to pressure firms to consider environmental regulations via the media, courts, protests, and lobbying (Spilker, 2013, pp. 55, 58f.). On the other hand, political rights, including media freedom, reduce political uncertainty and thus make a country more attractive to domestic and foreign investment (Choi & Samy, 2009, pp. 87f.). Harms and Ursprung (2002) have found that lower levels of political and civil repression are associated with higher levels of FDI. It follows that countries with high-level political rights have higher levels of trade and capital openness, and (via scale effects) higher CO_2 emissions. Political rights also contribute to economic stability, as they enable the government to obtain knowledge of economic problems (Pastor & Hilt, 1993, p. 492). In sum, the direction of the interaction effect between political rights and international economic integration is an empirical question. Spilker (2013) has found support for the hypothesis that political rights weaken the negative aspects of international trade; for this reason, we can expect the negative effect of trade openness to weaken as freedom rights increase.

In sum, the positive effect of international political integration on climate commitment is stronger in countries with higher levels of political rights. No such interaction effects are expected in relation to climate performance, as it is more difficult for the public to monitor the implementation of climate policies, which are also associated with considerable costs. Political rights may weaken negative pressures caused by economic openness on government behaviour, and strengthen the implementation of environmental regulations. However, the negative effects of economic openness on climate performance might also be stronger in countries with high- level political rights. They affect a country's ability to attract international trade and investment.

5.5.6 Civil rights

Based on the existing theoretical and empirical literature, no independent effect of civil rights on climate commitment is expected (see Chapter 4). The positive effects of international political integration may be more prevalent in countries with extensive civil rights. Acceptance of the rule of law makes it more likely that governments will enter into international climate treaties and act in accordance with their guidelines. Thus, the two incentives promoting international integration can strengthen each other. Governments that are more involved in IGOs and accept the rule of law at the domestic level tend to be more willing to join international climate agreements (and also perform better in reducing greenhouse gas emissions) than countries that have few civil rights and are less politically integrated at the international level. Moreover, as explained above, ecological-modernisation theory suggests that political and civil rights make a country more likely to consider environmental protection. This interaction effect is weaker on climate performance than commitment, as climate change mitigation is associated with considerable costs and is harder for the domestic and international public to control.

Following neoliberal institutionalism, economic openness (trade and capital openness) provides an incentive for countries to cooperate at the international level (see Chapter 3). Thus, the governments of economically open countries, which accept the rule of law at the domestic level, may be more willing to join international climate agreements than economically closed countries with few civil rights. However, Chapters 2 and 3 conclude that there is no clear effect of economic openness or economic interdependence on climate commitment. For this reason, no interaction effects with civil rights are expected.

Countries that accept the rule of law are more likely to implement environmental regulations. In addition, local communities can demand that the government act in accordance with existing law. However, in the case of climate change, there is a trade-off between economic growth from international trade and investment and climate protection. Independent of civil rights, the pressure to stay economically competitive is likely to be more important to climate performance. In this respect, therefore, no joint influence of economic openness and civil rights on climate performance is expected. For the same reason, no joint influence of economic interdependence and civil rights on climate commitment and performance is expected. While the rule of law may provide an incentive by encouraging governments to act in accordance with international treaties, market pressures matter more to governments.

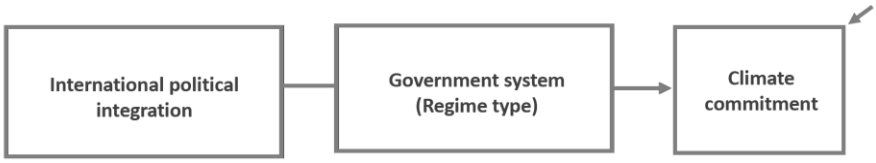
Economic openness influences climate performance also via its effect on economic growth. Civil rights may, as context factors of international trade and investment, moderate their effect on climate performance via economic growth. Spilker (2013, pp. 55, 59) has argued that democracy lessens the negative effects of economic openness (via economic growth) on the environment because civil rights, including property rights and the rule of law, provide a secure investment environment. This enables firms to use newer and more environmentally friendly technologies. In particular, capital openness may be associated with higher CO_2 emissions in countries with extensive civil rights. The democracy-FDI literature suggests that civil rights, such as property rights and the rule of law, make a country more attractive to multinational corporations by reducing the risk of expropriation (e.g.,

Jensen, 2003, p. 594; Henisz, 2000; Olson, 1993, p. 573; Peres et al. 2018, p. 628). The absence of the rule of law makes firms uncertain about their legal rights (Drabek & Payne, 2002, p. 782; Peres et al., 2018, p. 629). Inadequate rule of law contributes to corruption (Dahlström & Johnson, 2007; Peres et al., 2018, p. 629). In addition, property rights enable firms and individuals to use natural resources for their short-term interests. Biglaiser and Staats (2010) asked CEOs of US firms investing in Latin America about their investment decisions. They found that, among the characteristics of democracy, rule of law, democratic property rights, and a functioning court system were decisive for investment. This statistical analysis supports their survey results. They concluded that 'regime type alone is less important than factors more directly tied to investment risk' (Biglaiser & Staats, 2010, p. 509). Biglaiser and DeRouen (2006) have observed that property rights contribute to FDI. Harms and Ursprung (2002) have shown that political and civil repression make a country less attractive for FDI. Peres et al. (2018) have found that rule of law is an important explanatory factor in FDI. There is a separate literature on human rights and FDI. It has been argued that countries with low levels of human rights are more attractive for FDI because they allow multinational corporations to pay lower wages (Blanton & Blanton, 2007, p. 144; Tuman & Emmert, 2004, p. 13f.). Blanton and Blanton (2007, p. 146) have argued that wages have become less important to multinational corporations. This finding is in line with the argument that human rights imply higher levels of political stability and lower levels of uncertainty for foreign investment. Their empirical analysis supports this hypothesis. To conclude, the positive effect of international political integration on climate commitment is likely to be higher in countries with higher levels of civil rights. No such effect is expected on climate performance, which is associated with considerable socio-economic costs and is more difficult for the domestic and international public to control. Economic openness may interact with civil rights, in relation to its effect on climate performance. It is unclear whether there is a stronger negative effect of trade and capital openness in countries with high or low levels of civil rights.

5.5.7 Conclusions

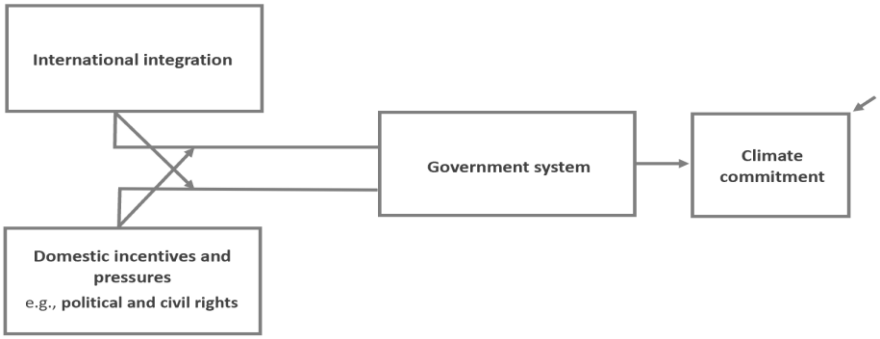
This section presents hypotheses on the joint influence of regime type and international political and economic integration (see Table 5.3). The regime-type approach to the policy consequences of globalisation assumes that democracies and autocracies differ in their responses to international integration. Previous research has focused on climate performance (Ruoff, 2009; Spilker, 2013). With regard to climate commitment, this chapter assumes that treaty design matters to the joint relationship between political globalisation and climate commitment. It expects the positive effect of international political integration on UNFCCC ratification to vary between democracies and autocracies (see Figure 5.7). It is an empirical question whether democracies or autocracies involved in IGOs are more likely to ratify the UNFCCC. Therefore, two competing hypotheses have been formulated.

Figure 5.7 Political globalisation, regime type, and UNFCCC ratification



While systemic differences are expected between democracies and autocracies, with regard to the effect of international political integration on UNFCCC ratification, only specific democratic qualities are likely to moderate the effect of international political integration on the more ambitious Kyoto Protocol. The positive effect of international political integration on Kyoto Protocol ratification is likely to be higher in countries with high-level political and/or civil rights, which enable ENGOs to pressure the government. Domestic pressures caused by ENGOs and international incentives derived from IGO involvement in Kyoto Protocol ratification may strengthen each other (see Figure 5.8). Second, governments that accept the rule of law at the domestic level may also be more likely to ratify hard climate treaties.

Figure 5.8 Political globalisation, political and civil rights, and Kyoto Protocol ratification



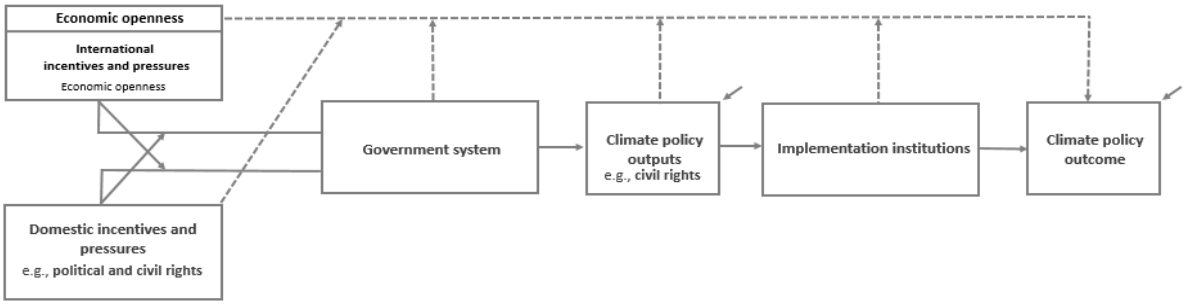
This study assumes that neither regime type nor specific democratic qualities moderate the effect of international political integration on climate performance, as it is difficult for the public to monitor the implementation of climate policies, which are also associated with considerable costs. Previous research has found no systemic differences between democracies and autocracies, with regard to the effect of international political integration on CO_2 emissions (Ruoff, 2009).

Among democratic qualities, political and civil rights may moderate the effect of international trade and investment on climate performance. As previously explained, there are competing hypotheses. On the one hand, they may weaken negative pressures caused by economic openness on government behaviour, and strengthen the implementation of environmental regulations (see Figure 5.9). On the other hand, they affect a country's ability to attract international trade and investment (see Figure 5.10). Political and civil rights are likely to moderate the effect of economic openness on climate performance via economic growth.

Table 5.3 Democracy, globalisation, and climate commitment and performance

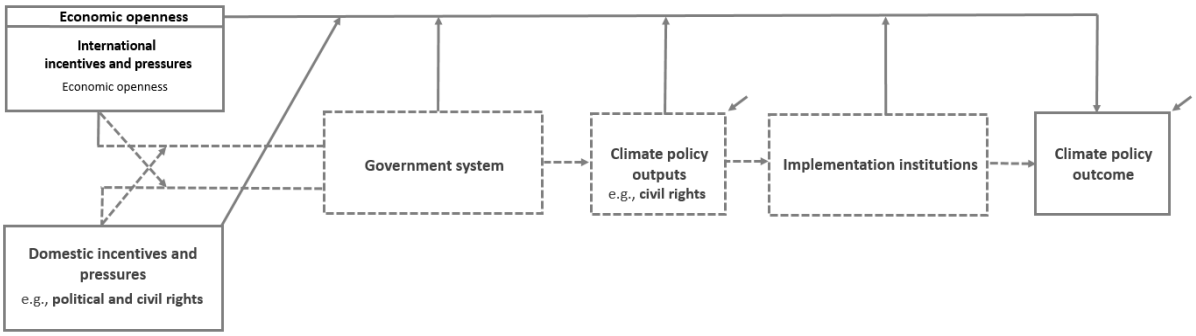
$H_{xdemocracy}1a$	International political integration contributes to UNFCCC ratification in democracies.
$H_{xdemocracy}1b$	International political integration contributes to UNFCCC ratification in autocracies.
$H_{xdemocracy}2a$	The positive effect to international political integration on Kyoto Protocol ratification should be stronger the higher a country's levels of political rights.
$H_{xdemocracy}2b$	The positive effect to international political integration on Kyoto Protocol ratification should be stronger the higher a country's levels of civil rights.
$H_{xdemocracy}3a$	The negative effect of economic openness on climate performance should be weaker the higher a developing country's levels of political rights.
$H_{xdemocracy}3b$	The negative effect of economic openness on climate performance should be stronger the higher a developing country's levels of political rights.
$H_{xdemocracy}4a$	The negative effect of economic openness on climate performance should be weaker the higher a developing country's levels of civil rights.
$H_{xdemocracy}4b$	The negative effect of economic openness on climate performance should be stronger the higher a developing country's levels of civil rights.

Figure 5.9 Economic openness and political and civil rights as incentives for government behaviour



Notes: The main argument of this figure is displayed by solid lines.

Figure 5.10 Political and civil rights as incentives for international trade and investment



Notes: The main argument of this figure is displayed by solid lines.

5.6 Conclusions

Do the effects of economic and political globalisation on climate commitment and performance depend on domestic political institutions? The broader literature on the environmental policy effects of international integration studies the importance of institutional constraints and ideological heterogeneity among veto players, regime type, and political corruption to explain state responses to globalisation. In response to the research question, this chapter has specified explanatory models of climate commitment and performance, based on these three perspectives, and formulated hypotheses for the empirical analysis.

The central argument of this chapter is as follows: while there is little reason to assume that domestic political institutions influence the relationship between economic interdependence and climate outcomes in developed countries, institutional variables are likely to moderate the effects of economic openness and international political integration on climate commitment and performance. The veto-player approach adds little to our understanding of the relationship between globalisation and climate commitment and performance. Left- and right-wing veto players consider a country's international competitiveness. It is an empirical question whether specific veto points matter to the relationship between political globalisation and Kyoto Protocol ratification, or to the effect of economic interdependence on climate outcomes in developed countries. In line with previous research, political corruption may influence the negative relationship between economic openness and climate performance in developing countries. It is an empirical question whether specific dimensions of political corruption are crucial and whether they strengthen or weaken the negative effects of international trade and investment. In contrast to earlier research, this chapter argues there is no general difference between democracies and autocracies in the effect of economic openness on global air pollution. Political and civil rights may moderate the effect of economic openness. This may explain why Spilker (2013) found no interaction effect between regime type and trade openness on climate performance. The present study assumes that the regime-type approach contributes to our understanding of the relationship between international political integration and climate commitment. The effect of international political integration on the UNFCCC may be higher in democracies or autocracies. By contrast, political and civil rights are likely to moderate the effect of international political integration on Kyoto Protocol ratification. In sum, the possible interaction effects of globalisation and domestic political institutions are likely to help explain cross-national variation in state participation in international climate cooperation. They vary, in accordance with the globalisation dimensions, between climate commitment and performance, as well as between UNFCCC and Kyoto Protocol ratification.

References

Ahlquist, John S. 2006. Economic policy, institutions, and capital flows: Portfolio and direct investment flows in developing countries. *International Studies Quarterly* 50(3):681–704.

Biglaiser, Glen, and Karl JR. DeRouen. 2006. Economic reforms and inflows of foreign direct investment in Latin America. *Latin American Research Review* 41(1):51-75.

Biglaiser, Glen, and Joseph L. Staats. 2010. Do political institutions affect foreign direct investment? A survey of U.S. corporations in Latin America. *Political Research Quarterly* 63(3):508–522.

Blanton, Shannon Lindsey, and Robert G. Blanton. 2007. What attracts foreign investors? An examination of human rights and foreign direct investment. *The Journal of Politics* 69(1):143–155.

Cao, Xun, and Aseem Prakash. 2012. Trade competition and environmental regulations: Domestic political constraints and issue visibility. *The Journal of Politics* 74(1): 66–82.

Chang, Shu-Chen. 2015. The effects of trade liberalization on environmental degradation. *Quality & Quantity* 49(1):235–253.

Choi, Seung-Whan, and Yiagadeesen Samy. 2008. Reexamining the effect of democratic institutions on inflows of foreign direct investment in developing countries. *Foreign Policy Analysis* 4(1):83–103.

Christoff, Peter, and Robyn Eckersley. 2011. Comparing state responses. In *Oxford handbook of climate change and society*, eds. John S. Dryzek, Richard B. Norgaard, and David Schlosberg, 431–448. Oxford et al.: Oxford University Press.

Cohen, Benjamin J. 2002. International finance. In *Handbook of international relations*, eds. Walter Carlsnaes, Thomas Risse, and Beth A. Simmons, 429–447. London et al.: Sage Publications.

Cole, Matthew A. 2007. Corruption, income and the environment: An empirical analysis. *Ecological Economics* 62(3-4):637–647.

Dahlström, Carl, and Andreas Johnson. 2007. Bureaucratic corruption, MNEs and FDI. Stockholm: CESIS - Centre of Excellence for Science and Innovation Studies. Royal Institute of Technology. (CESIS Electronic Working Paper Series 82).

Damania, Richard, Per G. Fredriksson, and John A. List. 2003. Trade liberalization, corruption, and environmental policy formation: theory and evidence. *Journal of Environmental Economics and Management* 46:490–512.

Desbordes, Rodolphe, and Vincenzo Verardi. 2017. Foreign direct investment and democracy: A robust fixed effects approach to a complex relationship. *Pacific Economic Review* 22(1):43–82.

Drabek, Zdenek, and Warren Payne. 2002. The impact of transparency on foreign direct investment. *Journal of Economic Integration* 17(4), 777–810.

Feng, Yi 2001. Political freedom, political instability, and policy uncertainty: A study of political institutions and private investment in developing countries. *International Studies Quarterly* 45: 271–294.

Fredriksson, Per G., John A. List, and Daniel L. Millimet. 2003. Bureaucratic corruption, environmental policy and inbound US FDI: theory and evidence. *Journal of Public Economics* 87(7-8):1407–1430.

Fuchs, Dieter. 2000. Typen und Indizes demokratischer Regime: Eine Analyse des Präsidentialismus- und des Veto-Spieler-Ansatzes. In *Demokratiemessung: Konzepte und Befunde im internationalen Vergleich*, eds. Hans-Joachim Lauth, Gert Pickel, and Christian Welzel, 27–48. Wiesbaden: Westdeutscher Verlag.

Ha, Eunyoung. 2008. Globalization, veto players, and welfare spending. *Comparative Political Studies* 41(6):783–813.

Ha, Eunyoung. 2012. Globalization, government ideology, and income inequality in developing countries. *The Journal of Politics* 74(2):541–557.

Hafner-Burton, Emilie M., and Kiyoteru Tsutsui. 2005. Human rights in a globalizing world: The paradox of empty promises. *American Journal of Sociology* 110(5): 1373–1411.

Haggard, Stephan. 1990. Pathways from periphery. The politics of growth in the newly industrializing countries. Ithaca & London: Cornell University Press.

Harms, Philipp, and Heinrich W. Ursprung. 2002. Do civil and political repression really boost foreign direct investments? *Economic Inquiry* 40(4):651–663.

Harnisch, Sebastian. 2013. Vergleichende Außen- und Sicherheitspolitik. In *Studienbuch Politikwissenschaft*, eds. Manfred G. Schmidt, Frieder Wolf, and Stefan Wurster, 411–438. Wiesbaden: Springer VS.

Harrison, Neil E. 2000. From the inside out: Domestic influences on global environment policy. In *Climate Change and American Foreign Policy*, ed. Paul G. Harris, 89–109. Houndmills et al.: Palgrave Macmillan.

Henisz, Witold J. 2000. The institutional environment for economic growth. *Economics & Politics* 12(1):1–31.

Henisz, Witold J. 2002. The institutional environment for infrastructure investment. *Industrial and Corporate Change* 11(2):355–389.

Jahn, Detlef. 2010. The veto player approach in macro-comparative politics. Concepts and measuruement. In *Reform processes and policy change*, eds. Thomas König, Marc Debus, and George Tsebelis, 43–68. New York, NY: Springer.

Jakobsen, Jo, and Indra de Soysa. 2006. Do foreign investors punish democracy? Theory and empirics, 1984-2001. *Kyklos* 59(3):383–410.

Jensen, Nathan M. 2003. Democratic governance and multinational corporations: Political regimes and inflows of foreign direct investment. *International Organization* 57, 587–616.

Leroy, Pieter, and Jan van Tatenhove. 2000. Political modernization theory and environmental politics. In *Environment and Global Modernity*, eds. Gert Spaargaren, Arthur P. J. Mol, and Frederick H. Buttel, 187–208. London et al.: Sage.

Li, Quan, and Adam Resnick. 2003. Reversal of fortunes: Democratic institutions and foreign direct investment inflows to developing countries. *International Organization* 57, 175–211.

McMann, Kelly, Daniel Pemstein, Brigitte Seim, Jan Teorell, and Staffan I. Lindberg. 2016. Strategies of validation: Assessing the varieties of democracy corruption data. Gothenburg: University of Gothenburg. The Varieties of Democracy Institute & Department of Political Science. (Working Paper 23).

Midlarsky, Manus I. 1998. Democracy and the environment: An empirical assessment. *Journal of Peace Research* 35(3):341–361.

Midlarsky, Manus I. 2001. Democracy and the environment. In *Environmental conflict*, eds. Paul F. Diehl, and Nils Petter Gleditsch, 155–178. Boulder & Oxford: Westview Press.

Milner, Helen V., and Keiko Kubota. 2005. Why the move to free trade? Democracy and trade policy in the developing countries. *International Organization* 59(1):107–143.

O'Donnell, Guillermo. 1978. Reflections on the patterns of change in the bureaucratic-authoritarian state. *Latin American Research Review* 13(1):3–38.

Olson, Mancur. 1993. Dictatorship, democracy, and development. *American Political Science Review* 87(3):567–576.

Oneal, John R. 1994. The affinity of foreign investors for authoritarian regimes. *Political Research Quarterly* 47(3):565–588.

Pastor, Manuel, and Eric Hilt. 1993. Private investment and democracy in Latin America. *World Development* 21(4):489–507.

Pastor, Manuel, and Jae Ho Sung. 1995. Private investment and democracy in the developing world. *Journal of Economic Issues* 29(1):223–243.

Payne, Rodger A. 1995. Freedom and the environment. *Journal of Democracy* 6(3):41–55.

Peres, Mihaela, Waquar Ameer, and Helian Xu. 2018. The impact of institutional quality on foreign direct investment inflows: evidence for developed and developing countries. *Economic Research-Ekonomska Istraživanja* 31(1):626–644.

Persson, Torsten, and Guido Tabellini. 2006. Democracy and development: The devil in the details. *American Economic Review* 96(2):319–324.

Putnam, Robert D. 1988. Diplomacy and domestic politics: the logic of two-level games. *International Organization* 42(3): 427–460.

Roller, Edeltraud. 2005. The performance of democracies. Political institutions and public policies. Oxford: Oxford University Press.

Ruoff, Gabriele. 2009. Grow rich and clean up later? Joint effects of IGO membership and democracy on environmental performance in developing countries. National Centre of Competence in Research (NCCR) (Challenges to Democracy in the 21st Century Working Paper 33).

Schmidt, Manfred G. 1993. Theorien in der international vergleichenden Staatstätigkeitsforschung. In Policy-Analyse (Politische Vierteljahresschrift Sonderheft, 24), ed. Adrienne Héritier, 371–394. Opladen: Westdeutscher Verlag.

Schmidt, Manfred G. 1996. When parties matter: A review of the possibilities and limits of partisan influence on public policy. *European Journal of Political Research* 30:155–183.

Schmidt, Manfred G., and Ostheim, Tobias. 2007. Die Lehre von der Parteiendifferenz. In *Der Wohlfahrtsstaat. Eine Einführung in den historischen und internationalen Vergleich*, eds. Manfred G. Schmidt, Tobias Ostheim, Nico A. Siegel, and Reimut Zohlnhöfer, 51–62. Wiesbaden: VS Verlag für Sozialwissenschaften.

Schulze, Kai. 2014. Do parties matter for international environmental cooperation? An analysis of environmental treaty participation by advanced industrialised democracies. *Environmental Politics* 23(1):115–139.

Spilker, Gabriele. 2012. Helpful organizations: Membership in inter-governmental organizations and environmental quality in developing countries. In *British Journal of Political Science* 42(2):345–370.

Spilker, Gabriele 2013. Globalization, political institutions and the environment in developing countries. New York, London: Routledge.

Tsebelis, George. 2002. Veto players. How political institutions work. New York & Princeton (New Jersey): Rusell Sage Foundation & Princeton University Press.

Tuman, John P., and Craig F. Emmert. 2004. The political economy of U.S. foreign direct investment in Latin America: A reappraisal. In *Latin American Research Review* 39(3):9–28.

Wenzelburger, Georg, and Reimut Zohlnhöfer. 2015. Konzepte und Begriffe in der Vergleichenden Policy-Forschung. In *Handbuch Policy-Forschung*, eds. Georg Wenzelburger, and Reimut Zohlnhöfer, 15–32. Wiesbaden: Springer VS.

Zahran, Sammy, Eunyi Kim, Xi Chen, and Mark Lubell. 2007. Ecological development and global climate change: A cross-national study of Kyoto Protocol ratification. *Society & Natural Resources* 20(1):37–55.

Zohlnhöfer, Reimut. 2005. Globalisierung der Wirtschaft und nationalstaatliche Anpassungsreaktionen. Theoretische Überlegungen. *Zeitschrift für Internationale Beziehungen* 12(1):41–75.

Zohlnhöfer, Reimut. 2008. Stand und Perspektiven der vergleichenden Staatstätigkeitsforschung. In *Die Zukunft der Policy-Forschung*, eds. Frank Janning, and Katrin Toens, 157–174. Wiesbaden: VS Verlag für Sozialwissenschaften.

Zohlnhöfer, Reimut. 2013. Policy-Wandel in der Demokratie. Ansätze einer Theorie. In *Staatstätigkeiten, Parteien und Demokratie. Festschrift für Manfred G. Schmidt*, ed. Klaus Armingeon, 377–388. Wiesbaden: Springer VS.

6 Research Design

Abstract

This study uses statistical methods to study the joint effect of globalisation and domestic political institutions on climate commitment and performance. This chapter describes case selection, the research period, the measurement of independent variables, and the treatment of missing values. To make these results comparable to earlier research, standard indicators of international economic and political integration are used. Chapters 4 and 5 conclude that the possible moderation effects of veto players, political corruption, and regime type on the influence of globalisation should be examined on a disaggregated basis. This chapter examines the concept validity of the selected measurement approaches. Finally, this chapter formulates control hypotheses and explains their measurement.

To answer the research question, this study applies statistical methods. I am interested in the cross-national variance of climate commitment and performance worldwide. Quantitative methods are suitable for analysing a large number of countries (e.g., Obinger, 2004, p. 32). Moreover, they make it possible to test the hypotheses (Lauth et al., 2009, pp. 16, 22). To address causal relationships, the statistical analyses are supplemented with short case studies. The varied findings of previous studies reflect, in part, differences in research design (see Chapters 2, 3 & 4). This chapter begins by explaining case selection and the research period (6.1). Second, it describes the measurement of independent variables (6.2).[56] Section 6.3 formulates control hypotheses for the multivariate analysis and explains their measurement. The criteria for the operationalisation of the independent variables were, in addition to validity and reliability, data availability and data comparability. Unfortunately, some data are still missing. The final section explains the treatment of missing values (6.4).

6.1 Case selection and research period

Global warming has only been regarded as a political problem at the international level since the early 1990s (see also Chapter 2). As this study focuses on state participation in climate cooperation within the UN climate change regime, the research period starts with the process of ratifying the UNFCCC in 1992 and ends in 2006. First, the global financial and economic crisis of 2007 changed the context of climate policy and resulted in economic growth-related reductions in greenhouse gas emissions. This is important to consider when analysing climate performance. Second, data are available for most variables up to 2006.[57] Finally, both international climate treaties (UNFCCC, Kyoto Protocol) came into force during this time.

As sampling methods cannot be used in macro-quantitative research, case selection determines possible inferences. A cross-county quantitative analysis also depends on comparable cases. Political processes in very small countries differ considerably from political decision-making processes in larger states. Following previous research, this study considers countries with at least 500,000 citizens during the research period. Data on population size from the World Bank's World Development Indicators (WDI) have been used (data access 2016). Only states that were independent for most years during the research period were examined.[58] The climate policies of non-independent countries depend on political processes in other countries. The data on county independence came from von Stein (no year a) and was expanded using information from the CIA World Factbook (data access 2016). Afghanistan, Iraq, Liberia, and Somalia were dropped from the analysis, as they did not have functioning independent governments during much of the research period. In accordance with the *polity2* variable of the Polity IV project, they were in a phase of transition, interruption, or interregnum.

Most authors of similar studies have pooled data on developed and developing countries (see Chapters 3 & 4). As Chapter 2 explained, it is important to consider differences between rich and poor countries when analysing climate commitment and performance. At the same time, there is a lack of variance among Annex I countries that ratified the UNFCCC and the Kyoto Protocol; EU member states joined the Kyoto Protocol together. This analysis of climate commitment therefore follows Prakash and Potoski (2007, p. 358) and Dolšak (2009, p. 562). I test explanatory models for the pooled analysis of countries worldwide, while statistically controlling Annex I status and the developing-country sample. In global-comparative studies, data availability is the only criterion used for case

[56] The measurement of the dependent variables is explained in Chapter 2.
[57] Data on policy diffusion and state membership in IGOs are available until 2005, and on IGO network centrality until 2003.
[58] East Timor was not analysed, as it only became independent in 2001. The Czech Republic, Slovak Republic, and Eritrea became independent in 1993. They are included in the analysis because they were independent for most of the research period.

selection (Jahn, 2013a, p. 236). Thus, the pooled sample includes all independent countries with a population of at least 500,000, for which data are available, which have not been in a phase of transition, interruption, or interregnum for much of the research period.

This study examines the climate performance of developed and developing countries separately. An important criterion for differentiation between poor and rich countries in cross-national climate policy research is the Annex I status. In addition to GDP per capita this classification is based on a country's contribution to worldwide greenhouse gas emissions and political considerations (Gupta, 2010, pp. 639, 641). I therefore consider a country's level of economic development (e.g., Landman, 2008, p. 269) to identify developed and developing countries. This study applies the World Bank classification of high-income economies as a threshold (see also Baek et al., 2009; Spilker, 2012). The WTO classified countries in 2005, using a GNI per capita higher than 10,725 US dollars (The World Bank Group, no year).[59] The 2005 threshold constitutes a high threshold, as the last year of the research period for most independent variables (with the exception of network centrality) (see also Spilker, 2012). Using the World Bank criteria, Annex I and Non-Annex I parties encompass both developed and developing countries (see Table A6.1 in the annex). This analysis of climate performance considers only high-income Annex I countries and non-high-income Non-Annex I countries. Annex I and Non-Annex I countries that are not classified as developed or developing countries, based on the World Bank criteria (e.g., Turkey), have been dropped from the analyses of climate performance and climate commitment in developing countries.

Given the limited comparability of the dependent variable, this analysis of climate performance does not consider post-communist countries (see also Garmann, 2014, p. 3; Obinger, 2000, p. 3). Post-communist countries have been identified in accordance with McCormick (2001, p. 7). Following the economic breakdown after the collapse of the Soviet Union, there was a reduction in greenhouse gas emissions that was not the result of environmental policies (Lynch, 2000, p. 430; Tosun, 2012, p. 441). Post-communist Annex I countries are also classified within the UNFCCC as economies in transition. For this reason, they have different obligations from other Annex I countries (Annex II countries) (UN, no year). Unfortunately, it is not possible to analyse them separately, due to a lack of data on major Eastern European countries. Moreover, this country group includes high-income and non-high-income countries, as well as Annex I and Non-Annex I parties to the UNFCCC. Data availability further restricts the developed and developing-country sample. The resulting developing-country sample encompasses up to 68 countries. The developed-country sample includes only 21 countries. However, the selected rich countries form a relatively homogenous sample of established democracies. McCormick (2001, p. 7) has identified them all as liberal democracies. The present sample of developed countries thus conforms to the most-similar-systems case design, which makes it possible to test hypotheses, as context-factors are controlled through the selection of similar countries (Jahn, 2013a, p. 252).[60]

6.2 Measurement of the independent variables[61]

This section describes the measurement of the main independent variables. As explained in Chapter 3, two conceptualisations of international economic integration are considered (economic openness and policy diffusion via important trading partners) as well as international political integration (state involvement in IGOs and state centrality in IGO networks). With regard to the measurement of these variables, this study applies standard indicators to make the results comparable.

The disaggregated measurements of the ideological heterogeneity of veto players and veto points, political-corruption dimensions, and regime-type differ from those in similar studies. To assess their validity and reliability, I have used the framework of concept validity developed by Pickel et al. (2015), which is based on the work of Munck and Verkuilen (2002) and Müller and Pickel (2007). Its underlying idea is that measurement approaches that fulfil criteria of empirical social research in the phases of index construction (conceptualisation, measurement and aggregation) constitute valid and reliable measurements.

Validity in the conceptualisation phase results from the transparency and adequacy of concept specification and concept logic (Pickel et al., 2015, pp. 500, 504ff.; see also Müller & Pickel, 2007; Munck & Verkuilen, 2002). Concept specification refers to the identification of a concept's attributes. Concepts must be differentiated from related variables, applicable to various cultural and spatial contexts (contextual range), and must include all relevant elements, while excluding irrelevant elements (parsimony). Transparency implies that concept attributes and their components are described and defined at different levels of abstraction. Concept logic refers to vertical and horizontal relationships between concept elements. Pickel et al. (2015, pp. 500, 506) have suggested the following criteria: explaining the relationships between the elements (coherence); assigning elements to the appropriate level

[59] For Iraq, Kosovo, North Korea, and Somalia, no data on GNI per capita in 2005 are available. Following McCormick (2001), they have been classified as developing countries.

[60] Chapter A6.1 in the annex describes the selection of developed countries in more detail.

[61] Parts of this chapter have been used in Escher & Walter-Rogg (2020, 2018).

of abstraction (no conflation); and ensuring that elements at different levels do not overlap (no redundancy). The following criteria are important in the measurement phase: the validity and reliability of indicators, multiple data sources, the possibility of replicating the measurement approach, and explaining data sources and measurement levels. The measurement level must maximise the homogeneity of cases within measurement classes and minimise the number of measurement classes (Munck & Verkuilen, 2002, p. 17). Jahn (2010, p. 45) adds that indicators should vary over time to allow for a panel analysis. Indicators must also be equivalent across countries. I also consider data availability and comparability across the whole country sample and research period. To evaluate validity in the aggregation phase, the literature recommends a theory-based aggregation rule, a theoretically and empirically adequate aggregation level that uses the horizontal and vertical relationships between elements of the concept, and theory-based weights as quality criteria. Reliability, robustness tests, and replicability are additional quality criteria in this phase.

6.2.1 Economic openness

Two types of indicators of economic openness can be distinguished (Chang, 2015, p. 243, see also Jahn, 2016b, p. 864; Schirm, 2007, p. 3). The first are indicators of policy openness, which measure the degree of liberalisation of a country's trade policy (e.g., trade tariffs, capital market controls) (Chang, 2015, p. 243; Holzinger et al., 2008, p. 561). The second are indicators of trade policy outcomes, i.e. trade, capital and financial flows (openness of outcome) (Chang, 2015, p. 243; Gilardi, 2013, p. 455). The latter approach 'measures the actual degree of trade openness' (Chang, 2015, p. 243). This study focuses on economic openness, defined as the extent of a country's economic interactions with other countries (see Chapter 3). It therefore applies indicators of openness of outcome[62]. Following EKC theory, the separate measurement of the technique, scale, and composition effects of trade-induced economic growth is preferred (e.g., Dean, 2002, p. 822). In accordance with most studies, the present study uses data on economic exchanges as a percentage of GDP (Babones, 2007, p. 146; De Soysa & Neumayer, 2005, p. 733; Jahn, 2009, p. 100; Milner & Keohane, 1996, p. 4; Zürn, 2002, p. 237, see also Chapter 3). First, this research is interested in the overall effect of economic openness. Second, data availability and comparability are limited, making it difficult to measure technique, scale, and composition effects separately.

The standard indicators of openness in outcome in empirical globalisation research are the percentage of total exports and imports of GDP (trade openness) and the percentage of the stock or flow of foreign direct investment (FDI) of GDP (capital openness) (Babones, 2007, p. 146; Gilardi, 2013, p. 455). In accordance with previous research on climate commitment and performance (see Chapter 3), the present study considers trade and capital openness. To reduce positive skewness, the percentage of the sum of exports and imports of GDP has been logged. As smaller countries often have a relatively high degree of trade openness, this is captured, following Babones (2007, pp. 147f.), by the residual of the OLS regression of logged trade openness on logged population size. Data on total imports and exports as a share of domestic GDP come from the World Bank Development Indicators (The World Bank Group, 2016a). FDI inflows, as a percentage of GDP, change fast (Babones, 2007, pp. 149f.). Thus, this study captures capital openness via the stock of FDI inflows, as a proportion of GDP (foreign investment penetration concept) based on data from UNCTAT (2015). Data on the indicators of trade and capital openness are available for countries worldwide and the complete research period. The effect of trade and capital openness are analysed separately. First, empirical studies find only low correlations between the dimensions of economic openness (Garrett & Mitchell, 2001, p. 156). Second, trade and capital openness may affect climate commitment and performance in different ways (see also Zohlnhöfer, 2015, p. 200). Given the available data, this study distinguishes between the type of goods traded between countries and the source of FDI.[63]

6.2.2 Economic interdependence

A country's degree of economic interdependence is conceptualised as policy diffusion via important trading partners (see Chapter 3). This study applies the spatial-regression measurement approach, which includes a spatial-effect variable as an independent variable in multiple regression models (Jahn, 2015, p. 262; Jahn, 2009, pp. 98ff.). This measurement approach makes it possible to analyse the effect of policy diffusion alongside other explanatory factors (Jahn, 2009, pp. 98f.) and interaction effects. There are various spatial models (Neumayer & Plümper, 2010, p. 589). Based on the assumption that climate commitment and performance in other countries influence the ratification and implementation of climate treaties in a particular country, a spatial lag-model (also spatial-autoregressive model) is used (Franzese & Hays, 2007, p. 143; Jahn, 2015, p. 262; Neumayer & Plümper, 2010, p. 589). The spatial effect or spatial lag variable results from the values of the dependent variable of connected countries (Jahn, 2015, pp. 262ff.; Jahn, 2009, pp. 98). It is estimated by comparing the weighed values of the dependent variables of all other countries with the values of the so-called spatial connectivity or weighting matrix. This matrix

[62] The validity and reliability of indicators of trade liberalisation are also restricted (Chang, 2015, p. 243).
[63] This may be an interesting research field for future studies (see Chapter 9).

measures the degree of intensity of the relationship of country i with all other countries k (Jahn, 2015, p. 262; Neumayer & Plümper, 2010, pp. 589, 591). This reflects the assumption that the more intense the relationship between countries, the stronger its effect on their policy outputs and outcomes (Jahn & Stephan, 2015, p. 24).
To construct the spatial-lag variable, a dichotomous or continuous variable is needed to measure the intensity of each country's interactions with all other countries (Jahn & Stephen, 2015, p. 24; Neumayer & Plümper, 2010, p. 591). Most studies have used bilateral trade flows as connectivity indicators (Jahn & Stephan, 2015, p. 27f.). The assumption is that a country's climate commitment and performance are influenced by the climate policies of its important trading partners (Jahn, 2013a, p. 366). Cao and Prakash (2010) have used the similarity of exported goods as a connectivity indicator. This measurement approach considers direct competition effects (Jahn & Stephan, 2015, p. 28). The present study uses data on bilateral trade flows as a connectivity variable. Domestic policymakers use simpler heuristics, such as the policies of important trading partners, when evaluating policy options (Jahn, 2006, p. 408). In addition, imports can also influence a country's climate performance (e.g., car imports). The connectivity variable can be directed or undirected (Neumayer & Plümper, 2010, p. 591). This study applies an undirected connectivity variable. To make the data collection manageable, a dichotomous variable is used to identify the five most important trading partners of each country, based on trade-relationship data (total imports and exports). The data come from the UN Comtrade database (UN Comtrade, 2017),[64] which provides data on trade flows (exports and imports) between country pairs. Trade flows are measured in US dollars, based on market and official exchange rates (Babones, 2007, p. 149). This study uses annual data on exports and imports of commodities. As I have collected time-series cross-sectional data, the connectivity indicator is used to create a NxNxT spatial-weights matrix W for country pairs i and j (Jahn, 2006, p. 411f.)[65]. The connectivity matrix has been row-standardised i.e. 'each cell of the [connectivity] matrix is divided by the row-sum of cells' (Neumayer & Plümper, 2010, p. 591). Plümper and Neumayer (2010, p. 420; Neumayer & Plümper, 2012, p. 828; Neumayer & Plümper, 2010 p. 591) argue that the application of row-standardisation depends on the theoretical assumptions and research design. Row-standardisation assumes that exposure to diffusion is equal across countries (Neumayer & Plümper, 2012, p. 827f.). I regard the five most important trading partners as equally influential. The values of the weighting matrix for country pairs it and jt is then multiplied by an N vector of the dependent variable of linked countries j,t. The spatial lag variable results from total product of each country i. I multiply the connectivity matrix by the vector of the dependent variable (climate commitment and performance). The following countries were considered in the construction of the spatial-lag variables: all countries used in the analysis of climate commitment and selected developed and developing-country samples used to analyse climate performance. To estimate the spatial-lag variable, I used the STATA *spmon* command cited by Neumayer and Plümper (2010).

6.2.3 International political integration

The political globalisation/environment literature conceptualises international political integration as either state involvement in international IGOs and/or INGOs, or as state centrality in international IGO/INGO networks. The present study limits international political integration to state involvement in IGOs and state centrality in IGO networks. Data were not freely available on the presence of INGOs in countries at the time of data collection.[66] Moreover, this measurement approach makes these results comparable to similar studies. Panel data on network centrality is only available for IGO links (von Stein, 2008, p. 264f.). Ward (2006, pp. 150) finds that '[c]entrality in the environmental network is highly correlated with centrality in more general international networks.' The KOF index of political globalisation uses the number of foreign embassies, per capita state contributions to UN Security Council missions, and international treaties that a country has signed and ratified (Dreher, 2006, p. 1093; Gygli et al., 2019, pp. 545, 555, 557f.). Data on participation in UN peacekeeping missions is not comparable across countries, as the form of participation varies considerably between countries (Martens & Zywitz, 2006, p. 347). The diplomatic-relations indicator cannot adequately capture the level of international political integration of small countries, which often install embassies covering multiple countries (Martens & Zywitz, 2006, p. 338). The ratification of international treaties overlaps with climate commitment. Consequently, this study focuses on state involvement in IGOs.
Four approaches to measuring IGO influence can be distinguished: a country's annual number of IGO memberships, IGO co-memberships (e.g., Russett & Oneal, 2001), and IGO ties to other countries (network centrality) (e.g., von Stein, 2008; Ward, 2006), as well as the spatial lag of IGO co-memberships and the dependent variable (e.g., Yamagata et al., 2013). This study applies the most common indicator: a country's annual number of IGO memberships (e.g., Bernauer et al., 2010; Ruoff, 2009; Spilker, 2013, 2012). Martens and Zywitz (2006, p. 341)

[64] Data from the IMF Direction of Trade Statistics (DOTS) are not freely available.
[65] To construct the spatial lag variable, a dyadic dataset was created (Neumayer & Plümper, 2010, p. 595). It contains two variables that indicate units i and k, a year variable, the connectivity variable, and the lagged dependent variable.
[66] Since 2018, the KOF Index of globalisation has included data on international NGOs. Yet, it offers only data on the overall index (Gygli et al., 2019).

have argued that the more IGO memberships a country has, the more linkages it has to global institutions. They prefer this measure to the number of new IGO memberships in a year because existing memberships limit new ones (Ruoff, 2009, pp. 13f.).
Several studies differentiate between types of IGOs (e.g., Ruoff, 2009, p. 19; Spilker, 2012). Given the available data, this study focuses on the general influence of IGO memberships, relying on annual IGO membership data through 2005 from the Correlates of War Project International Governmental Organisations Data Set (version 2.3) (Pevehouse et al. 2010, see also Bernauer et al., 2010; Ruoff, 2009; Spilker, 2013, 2012). These data consider only IGOs that have (1) at least three members that are sovereign states, (2) regular plenary sessions (at least one in ten years), and (3) permanent headquarters (Pevehouse & Nordstrom, 2003, p. 2). The present study counts full memberships in IGOs. Bernauer et al. (2010, p. 527) found no difference in their results when they analysed full, associated, and observer membership IGOs; full memberships alone; or full membership and observer status. Missing values (-1) and 'no state system member' (-9) of individual IGOs are coded as zero in this study (no membership).
Following Ward (2006), this study also tests a country's degree of international political integration via its centrality in the IGO network. Ward (2006) measures a country's centrality by 'the number of network ties it has to other countries' (von Stein, 2008, p. 251). Network ties refer to the number of co-memberships of country i with another country j (Ward, 2006, p. 152). Thus, network centrality 'increases as a function of the number of other nations i is linked with and, for any such nation j, the number of treaties both i and j are parties to' (Ward, 2006, p. 152). Annual data on state centrality in IGO networks are drawn from von Stein (2008, p. 252, von Stein, no year b); these data are from 1991 to 2003. She counts a country's annual number of IGO links to other states (von Stein, 2008 p. 252).

6.2.4 Ideological heterogeneity among veto players

As Chapter 4 explains, this study considers both ideological heterogeneity among veto players and institutional constraints. Accordingly, two measurement approaches can be distinguished within the veto-player and point literature: following Tsebelis's (2002, 1995) analysis of the interaction between the policy preferences of political actors and institutional constraints, and the measurement of institutional constraints of government autonomy (i.e. the number of potential veto points) (Jahn, 2010, pp. 46f.). This section outlines the ways in which ideological heterogeneity is measured among veto players. The following section explains the operationalisation of political institutional constraints.
There is a lack of valid and reliable panel data on the ideological heterogeneity of veto players outside the developed world. While many measurement approaches refer to Tsebelis's veto-player concept, they conceptualise and measure veto-point influence (Wenzelburger & Zohlnhöfer, 2014, p. 319). This applies, for instance, to the DPI's 'Checks and Balances' measure, which offers time-series cross-sectional data for large N-studies (Cruz et al., 2016a). Only Hensiz's (2002, 2000) measures offer worldwide panel data and conceptualise and measure the interaction between political institutions and the policy preferences of political actors (Tsebelis, 2010, p. 12; Tsebelis, 2002, pp. 204f.). Chapter A6.2 in the annex examines these in order to establish whether they are valid and reliable measures of veto-player influence. It concludes that they show considerable validity and reliability problems in all three phases of index construction. Variation in both measures reflects the number of veto players and the fractionalisation of legislative chambers. Additionally, existing veto-player measures do not acknowledge that potential veto players vary between domestic policy and international treaty ratification. This section explains the measurement approach used in this study.
According to Tsebelis (2010, p. 8), potential institutional veto players must be identified for each country year, during the phase of conceptualisation (see also Wenzelburger & Zohlnhöfer, 2014, p. 319). Institutional veto players are defined by the constitution (Tsebelis, 2002). As Chapter 5 explains, following Jahn (2010), only the most important potential veto players should be considered; these people (the president, coalition government and upper and lower chamber) are involved in nearly all political decisions. The analysis of climate commitment and performance must take into account the fact that the number and composition of institutional veto players varies between domestic policy and international treaty ratification. Second, partisan veto players, i.e. political parties within institutional veto players, must be identified (Tsebelis 2010, p. 8). Partisan veto players are government parties. In cases where there is no government majority in the legislature, this study considers opposition parties as well. Third, the number of policy-preference dimensions must be examined (Tsebelis, 2010, p. 8). This study regards policy preferences as unidimensional across the left/right dimension (see Chapters 4 & 5). Fourth, the distance between veto players' policy preferences must be estimated (Wenzelburger & Zohlnhöfer, 2014, p. 319). As Chapter 4 explains, in a one-dimensional policy space, the ideological distance between the most extreme veto players is decisive (Tsebelis, 2002). Ideological heterogeneity among veto players in this analysis of climate performance is defined as the distance between left- and right-wing partisan veto players, within institutional veto players (the president, coalition government, and first and second legislative chambers) (see Chapter 5). In the analysis of climate commitment, only the presence of a right-wing veto player is decisive (see Chapter 4).

The following section explains the measurement approach used in this study. Separate veto-player measures have been developed for the commitment and performance models. This means that, in the analysis of UNFCCC and Kyoto Protocol ratification, political institutions are only considered if they have veto-player status in international treaty ratification. With regard to climate performance, veto players in domestic policy are relevant, as they must agree to changes in domestic law, supporting the adoption and to implementation of climate policies.

For the president, as well as the upper and lower chambers, two dichotomous variables are created that indicate veto-player status in international treaty ratification and domestic policy. Given the available data, codings of developed and developing countries rely on different data sources. This study codes the veto-player status of the president, in the ratification process of developing countries, based on information from Simmons (2009); it codes the status of the upper and lower legislative chambers in developing countries, based on information from Hathaway (2007). Simmons (2009) provides descriptions of the formal ratification process, based on national constitutions and worldwide laws. A code indicates whether the president of a particular country is a veto player in the ratification process. The veto-player status of political institutions in developed countries ratifying international treaties is coded, when possible, using information from Bookmann (no year); otherwise, information is drawn from Hathaway (2008) and Simmons (2009), as described above. Hathaway's (2008) information is also used to code the veto-player status of upper and lower legislative houses in developing countries. The veto-player status of the president in poor countries is captured by the '*system* indicator from the Database of Political Institutions (DPI) 2015 (Cruz et al., 2016a). *System* codes political systems as parliamentary (2), assembly-elected president (1), and presidential (0). Countries described as presidential systems are coded as having a presidential veto player. The veto-player status of the upper and lower chambers of the legislature and the president in developed countries are coded using information provided by Jahn (2010). While Bookmann (no year), Hathaway (2008), and Simmons (2009) offer legal information, Jahn (2010) considers the rules in use, as well as changes over time. Unfortunately, such data are not available for developing countries.

Within Tsebelis' veto player theory the preferences of political actors must be measured to assess the relative position of veto players (Ganghof, 2003, p. 3; Jahn, 2010, p. 45; Tsebelis, 2002, p. 8). Previous measurement approaches have relied on different data types: (1) the ideology positions of parties, based on party programs or expert survey assessments; (2) assessments of the ideology of political parties; (3) text analyses; and (4) estimated preferences (Ganghof, 2003, p. 3; Tsebelis, 2010, p. 8; Wenzelburger & Zohlnhöfer, 2014, p. 319). From a theoretical perspective, it is preferable to have a metric measurement of the political preferences of partisan veto players. Unfortunately, there is a lack of data on the policy preferences of partisan veto players in developing countries. Party ideology is therefore used an as an indicator of the policy preferences of veto players. The Database of Political Institutions (2015), cited in Cruz et al. (2016a), provides the broadest set of data available on the number of countries. It encompasses data on the name and party ideology (left, right, centre) of the head of the executive branch, the three largest government parties in the lower house, and the largest opposition parties in the lower house. Its codes for political ideology are solely based on party descriptions. Alternative indicators are used where available (mainly in developed countries). Dichotomous variables created for each institutional veto player indicate whether a left, right, or centre partisan veto player is present. If a political institution has no veto-player power, political ideology dummies of partisan veto players are coded with zero. I use the DPI (2015) party ideology variable ('*execrlc'*) for the head of the executive branch, drawn from Cruz et al. (2016a) as an indicator of the president's party ideology. Using information on the president's party in Hensiz (2002, data release 2012) (executive party), I code, for developed countries, the president's party ideology as left/right/centre, using the party-ideology codes proposed by Armingeon et al. (2015). Where available, I code the dichotomous variables, based on information on the relative share of left/right and centre parties in government, provided by Armingeon et al. (2015), as indicators of the policy preferences of partisan veto players in the lower house of parliament. In Switzerland (1991), Denmark (1995–1997), Finland (1991), and the Netherlands (2002) there is no majority of a group of parties that share the same ideology. In these cases, I consider the party ideology of all party families that share the largest number of seats. For all other countries, this study uses DPI (2015) information on the party ideology of the three largest government parties in the lower house of parliament. Unfortunately, the DPI only provides information on the party ideologies of the three largest government parties in parliament. For the lower house of parliament, I code dichotomous variables, which measure whether at least one government party has a left, right, or centre ideology. A dummy variable indicates whether the government has a majority in the lower house of parliament or not. Data on the number of government party seats in parliament ('*numgov'*) and total seats in parliament ('*totalseats'*) come from the DPI (2015). Three additional dichotomous variables record the party ideologies of opposition parties, if the government has no majority in the lower house of parliament. Three dummies measure whether, in the case of a minority government, there is a left, right or centre majority among opposition parties. If the government has no majority in the lower house of parliament, I use, where available (developed countries), Swank's (2013) indicators of the largest relative share of left/right/centre parties in the lower chamber to indicate the opposition's policy preference. For all other countries, I use the political ideology of the largest opposition party, based on the DPI indicator.

No data on the political ideologies of political parties in the upper house are available for developing countries. Henisz (2002) provides data on the party affiliation of the president and upper and lower houses of parliament. He does not distinguish between government and opposition parties. Henisz's (2002) data on the party composition of the upper house are coded, using party codes provided by Armingeon et al. (2015), where available (developed countries). In all other cases, these data come from the DPI 2015 (Cruz et al., 2016a) codings of the ideologies of political parties. To measure the policy preferences of partisan veto players in the upper house, dichotomous variables are coded; these measure whether most seats are held by political parties with left, centre, or right political ideologies. If there is no left/centre/right majority in the upper house of parliament, all political parties are regarded as veto players (where no additional information is available).

Only nominal data on the party ideologies of partisan veto players are available for developing countries. For this reason, the ideological distance between the two most extreme veto players cannot be measured. As an alternative, a dichotomous variable is coded to measure left/right polarisation among institutional veto players. To this end, I code three dichotomous variables, which indicate whether there is at least one left, right, or centre partisan veto player political party within the group of institutional veto players. On this basis, I code three dichotomous variables that measure whether there is at least one left, centre, or right veto player in a country year. For the analysis of climate performance, a dummy variable measures whether there is at least one left and one right partisan veto player in a country year, in order to measure veto-player influence on a left/right-scale. In accordance with the absorption rule, centre veto players are not considered. Following Schulze (2014, pp. 122f.), I use a dummy variable that indicates whether there is at least a right veto player in a country year, to analyse climate commitment.

Table 6.1 Bivariate correlations among veto player indices (Developed countries, 1991–2005)

	Left-right polarisation	Jahn1	Jahn2	Polcon iii	Polcon v
Left-right polarisation	1				
Jahn1	.464***	1			
Jahn2	.461***	.990***	1		
Polcon iii	.304***	.204***	.195***	1	
Polcon v	.141**	.231***	.248***	.443***	1

Notes: N=308

The veto-player concept has been developed in the context of established democracies. For this reason, I have not applied indicators to non-established democracies. Non-established democracies have the value 0 for both veto-player influence measures (see also Hensiz, 2002). A dichotomous variable measures whether a country is a democracy in a particular year, based on information from Polity IV (Marshall et al., 2015) and Freedom House (2015). A country is regarded as a democracy in a particular country year if its Freedom House status is free or partly free and the *polity2* index from Polity IV is greater than 5. The country is also regarded as a democracy if either *polity2* or the Freedom House status index indicate a democracy and the other one is missing. I use data from Freedom House in order to transfer the veto-player concept, as the measurement is based on a more demanding understanding of democracy than the electoral democracy concept. Freedom House also considers rules in use. I supplement this data via the *polity2* indicator. Unlike Freedom House, it considers checks and balances. A stricter threshold value is applied to the Polity IV index, which focuses mainly on rules of law. Finally, Freedom House and Polity IV data are available for most countries and the whole research period. Both veto player indices are defined as missing in democratic country-years of transition, occupation, or interruption as the veto-player status of political institutions is questionable during such periods. Table 6.1 examines the bivariate correlations between multiple measures of ideological heterogeneity of veto players for the panel data set of the developed Annex I country sample (from 1991 to 2005). In addition to the proxy for left/right polarisation, I consider the measures proposed by Henisz (2002, 2000) and Jahn (2010). *Jahn1* is based on Tsebelis's measure and *Jahn2* performs well with regard to validity and reliability in the three phases of index construction. *Jahn1* and *Jahn2* have a higher correlation with left/right polarisation than with Hensiz's (2000, 2002) *polcon iii* or *polcon v*. In addition, the results of the following analysis of climate performance in developed countries stay stable when *Jahn2* is used instead of left/right polarisation.

6.2.5 Veto points

Based on the literature review, Chapter 4 argued that no uniform effect of institutional veto players could be assumed. This study therefore tests the effect of institutional veto players separately. Data from the World Bank Dataset of Political Institutions (Cruz et al., 2016a) are used to consider the fragmentation of government by multiple government parties. In accordance with the veto-player measures, the number of government parties is zero in non-democracies (see Section 6.2.4) and in years of transition, interruption, and interregnum (Polity IV). A dichotomous variable, which indicates the veto-player status of the president in domestic policy/international treaty

ratification, is used to assess the difference between presidential and parliamentary systems. The measurement is described in Section 6.2.4. The measurement of the veto-player status of the upper chamber of the legislature in the analysis of climate commitment and performance has been described in the previous section. In the climate-performance analysis, data from Cheibub et al. (2010, 2009) are also used to consider differences between presidential and semi-presidential democracies. Presidentialism is not considered in the present analysis of climate performance in developed countries, due to a lack of variance (see Chapter 8).

6.2.6 Government ideology

Statistical analyses of government ideology and climate commitment and performance have used multiple indicators. These have included the seat share of political parties belonging to a particular party family in government or parliament or the policy preferences of political parties, based on expert evaluations of party manifestos. Data on the policy preferences of political parties, based on expert evaluations, are unavailable for most countries outside the developed world. The present indicators are therefore based on the seat share of particular party families in government. The available data make it possible to distinguish left, right, centre, and green or left-libertarian political parties in developed countries and left, right, and centre political parties outside the developed world. This study therefore focuses on the left/right dimension. To consider variation among non-left parties (Schmidt, 1996, p. 158), I apply a left-centre-right categorisation. The analysis of the climate performance of developed countries controls the effect of left-libertarian parties in parliament. Left-libertarian government ideology is not considered, as there was little variation during the research period. The available data makes it possible to measure government ideology by the percentage of governments seats held by political parties that belong to the same party family, in this analysis of the climate performance of developed countries. Government ideology is measured in the commitment and performance analyses of developing countries by the ideology of the largest government party in parliament in parliamentary democracies and of the chief of executive in presidential democracies (see Section 6.2.4) or, if available, the ideology of the largest party family present in government, as measured by cabinet seats. Party-difference theory was developed in the OECD context. For this reason, non-established democracies receive the value 0 for government ideology variables (see Section 6.2.4).

6.2.7 Political corruption

This chapter explains the use of the Varieties of Democracy project (V-Dem) corruption measures (McMann et al., 2016), discussing their validity and reliability in the phases of index construction. The Corruption Perception Index (CPI) developed by Transparency International (TI) (2016a, b) and the Control of Corruption measure created by World Governance Indicators (WGI) (Kaufmann et al., 2010) have been frequently used in cross-national research; they show considerable validity problems, as indicators of political corruption in all three measurement phases (see Chapter A6.3 in the annex). Moreover, they measure public perceptions of corruption, rather than political corruption itself. The WGI index is broader than the political-corruption concept in its measurement. The corruption measure provided by the International Country Risk Guide (ICRG) has also been applied in previous research (see Chapter 4). Its data and methodology description are not freely available.

The V-Dem Political Corruption Index performs well during the conceptualisation phase. Political corruption has been defined as 'the misuse of public office for private gain' (Treisman, 2000, p. 399) by political decision-makers and public officials (see Chapter 4, see also Knack, 2006, p. 5; Rothstein & Teorell, 2008, p. 170; Treisman, 2007, p. 211). This conceptualisation underlies the V-Dem measure (McMann et al., 2016, p. 8). The Political Corruption Index presents no problems in relation to concept specification or logic. Its underlying concept is restricted to the corrupt behaviour of political decision-makers and public officials, differentiating it from related concepts (e.g., the corrupt behaviour of non-political actors) (McMann et al., 2016, p. 10). Second, it addresses various forms of political corruption that are considered equally important: corruption by the executive, judicial, and legislative branches, and by the public sector. It further specifies sub-dimensions of executive and public sector corruption. Third, it considers grand and petty corruption (McMann et al., 2016, p. 9); it is also transparent.

Political-corruption measures developed for large-N analyses, are based on expert evaluations and/or citizen and firm surveys[67]. The V-Dem corruption data are based only on the former (McMann et al., 2016, p. 6). They may be culturally biased, when non-native experts are considered (Treisman, 2007, p. 215). McMann et al. (2016, pp. 6, 14) strengthen the reliability of their measurement by using multiple coders, including native scholars for each country year, and applying the same coding procedures over time and across countries. Many scholars prefer to use survey data to measure corruption, as opposed to data derived from expert evaluations (McMann et al. 2016, pp. 1f.). However, citizens' perceptions limit the measurement of political corruption to public-service corruption (McMann et al., 2016, p. 13; Knack, 2006, p. 6) and thus neglect corruption within the state (Knack, 2006, p. 6).

[67] As corruption refers to illegal behaviour, there are no easily available observable indicators to measure the level of corruption in a country (Transparency International, 2016b).

Citizens primarily have contact with public officials. They may underestimate corruption in stable democracies, where political corruption 'is more removed from citizen lives' (McMann et al., 2016, p. 13). Pellegrini (2011, p. 25) assumes that public-perception data overrate corruption during corruption scandals and underrate it at times of economic growth. Moreover, corruption-perception data may depend on cross-national differences in trust in government, satisfaction with the socio-economic situation, the importance of corruption as a media topic, and anti-corruption policies (Donchev & Ujhelyi, 2014, p. 314; Treisman, 2007, p. 215). Finally, survey items can be understood in different ways, depending on the cultural context (Treisman, 2007, pp. 215f.). To summarise, both expert evaluations and citizen perceptions have advantages and disadvantages. Measures that consider multiple data types are therefore preferable.

The Political Corruption Index is based on six indicators. Legislative and judicial corruption are each measured by a single indicator. The measures of executive and public sector corruption are based on two indicators. The index considers all dimensions of political corruption and performs well with regard to content validity, based on the definition of political corruption (McMann et al., 2016, p. 8f, 12). With regard to face-validity, the measure does not include indicators that measure other concepts (McMann et al., 2016, p. 10). Few countries are left off the V-Dem political corruption index, which is comparable across countries and over time (McMann et al., 2016, pp. 15ff.). First, it is based on the same indicators for each country year (McMann et al., 2016, p. 15). Second, comparability is achieved by using the same coding rules and coders for each country year (McMann et al., 2016, p. 15). The aggregation rule reflects the underlying concept. It explains its aggregation rule via its concept of political corruption. V-Dem begins by aggregating the expert evaluations, using an item-response theory-measurement model (McMann et al., 2016, p. 6). The indicators related to executive corruption and public corruption are aggregated using a Bayesian factor analysis (McMann et al., 2016, p. 14). Corruption is the mean value of the six forms of political corruption measures. Therefore, each form of political corruption is weighted equally (McMann et al., 2016, p. 14).

To summarise, the Political Corruption Index presents no problems with regard to validity during the conceptualisation and aggregation phase. A disadvantage of the Political Corruption Index during the measurement phase is the fact that it considers only expert evaluations from the V-Dem data. However, alternative measures, which rely on citizen perceptions, face problems with validity and reliability. In addition, the Political Corruption Index offers sub-indices of legislative, executive, judicial, and public-authority corruption. This makes it possible to test the effect of specific forms of political corruption (McMann et al., 2016, p.11). It also enables researchers to examine executive, legislative, and public sector corruption separately, as discussed in the conclusion to Chapters 4 and 5. The overall political corruption measure is applied in some models as a control variable.

6.2.8 Regime type

As Chapters 4 and 5 explain, this study examines the effect of regime type, as well as specific democratic qualities, on climate commitment and performance. It also conceptualises and measures regime type as a dichotomous variable. As Chapter 4 argues, a minimalist conception of democracy is well-suited to studying systemic differences between democracies and autocracies, in relation to climate commitment and performance. Here, data from Cheibub et al. (2010, 2009) are applied. This approach is based on a minimalist conception of electoral democracy; it performs well during the three phases of index construction. To consider arguments that the length of the experience of democracy is decisive, this study also tests a regime-type variable, based on a maximalist conception of democracy (see Chapter 4). The regime-type variable is derived from the construction of indicators of veto-player veto points and policy preferences (see Section 6.2.4). As previously explained, this dichotomous variable uses data from Freedom House and Polity IV.

For the separate measurement of the effect of vertical and horizontal accountability and political and civil rights, it is necessary to have valid and reliable measures, with indicators and data that do not overlap, are available and comparable for countries worldwide, and cover the whole research period. The present study relies on mid-level indices from V-Dem (Coppedge et al., 2016) to operationalise the institutional traits of democracy. The following four sections explain the measurement of specific democracy-quality dimensions.

6.2.9 Vertical accountability

Merkel (2004, pp. 38, 42; Merkel, 2016, p. 261) identifies four institutional aspects of electoral regimes that secure vertical accountability: universal and active suffrage, the universal and passive right to vote, free and fair elections, and elected political representatives. It is important to consider competition as well. Governments are only responsive to citizens' climate-policy preferences if elections make a difference (see Chapter 4). Bühlmann et al. (2012, p. 125), following Bartolini (2000, p. 61), distinguish between two sub-dimensions of competition: contestability, i.e. the opportunities for parties and candidates to participate in elections, and vulnerability, i.e. uncertainty of election results.

The following empirical analysis relies on the Vertical Accountability Index cited by Lührmann et al. (2017), Coppedge et al., (2017a), and Pemstein et al. (2017). Alternative measures, which have been used in similar studies and offer data for large-N analyses, have validity and reliability problems (Freedom House Political Rights Measure and Vanhanen's Index of Democratisation). The Freedom House Political Rights measure is associated with validity problems in all three phases of index construction, as an indicator of vertical accountability. The index of democratisation is problematic in the conceptualisation and measurement phase. While the concept underpinning the former is too maximalist, the latter neglects relevant elements of vertical accountability. Indicators from both measures have problems with content validity; comparability over time is restricted. The aggregation rule in the political rights measure is not explained. The Democracy Barometer offers only disaggregated data for developed countries. Disaggregated data from Freedom House are not available for the complete research period. Chapter A6.4 in the annex discusses the reliability and validity of these measurement approaches in detail. The Voice and Accountability Index produced by the World Bank Governance Indicators is not considered here. It summarises data on electoral regimes and political rights. The following section explains that Lührmann et al.'s (2017) Vertical Accountability Index performs well, in relation to validity and reliability, during the three phases of index construction.

The Vertical Accountability Index performs well during the conceptualisation phase. First, it is transparent. Second, conceptualisation does not violate the concept logic criteria. It explains the horizontal and vertical interrelationship between elements in the concept, which is not characterised by redundancy or conflation. The underlying concept is also coherent. The index identifies sub-components of accountability via elections and political parties, specifying the hierarchical structure of its elements. Lührmann et al. (2017) assume that political systems without electoral accountability have lower levels of vertical accountability, regardless of political parties. They understand vertical accountability to be 'the ability of a state's population to hold its government accountable through elections and political parties' (Lührmann et al., 2017, p. 7; see also Coppedge et al., 2017b, p. 77). Thus, two components of vertical accountability are identified: citizens can control their governments by participating in free and fair elections (electoral accountability) and also by organising and participating in political parties (Coppedge et al., 2017b, p. 77; Lührmann et al., 2017, pp. 7, 11). Lührmann et al. (2017, p. 12) distinguish three components of electoral accountability: the quality of elections (free and fair elections), the percentage of the enfranchised population (non-exclusion of citizens from elections) and the direct or indirect election of the head of the executive branch. Citizen control over the exercise, via elections and political parties, is situated on the same level of the concept tree. Third, it applies to both democracies and non-democracies. It is acknowledged that autocracies can also be characterised, to some extent, by accountable governments (Lührmann et al., 2017, p. 9). However, countries without national elections are treated as having lower levels of accountability, regardless of the extent to which citizens control the government via political parties (Lührmann et al., 2017, p. 61). Fourth, the basic concept is parsimonious. It considers nearly all relevant elements of vertical accountability, following Merkel (2016, p. 261; Merkel, 2004, pp. 38, 42), with the exception of active suffrage. The concept includes the extent to which citizens organise and participate in political parties. In many democracies, political parties are of central importance to active suffrage.

The Vertical Accountability Index has no problems in the measurement phase. Its indicators are characterised by content validity and cover the complete underlying concept. It considers indicators of the autonomy and capacity of the body 'charged with administering national elections' (Coppedge et al., 2017b, p. 87), the existence and use of an election voter registry, voting irregularities, government intimidation, and the extent to which elections are free and fair (Coppedge et al., 2017b, p. 77). It also includes the government's treatment of the opposition (Coppedge et al., 2017b, p. 77). The extent to which citizens are excluded from electoral accountability is measured using the percentage of people within the population who have the right to vote (Coppedge et al., 2017b, p. 77; Lührmann et al. 2017, p. 12). Finally, the index captures whether the head of the executive branch is chosen through direct or indirect elections (Coppedge et al., 2017b, p. 77). Citizen control over the government, via organisation and participation in political parties, is captured by multiple indicators: barriers to forming a political party, restriction of opposition parties, and their degree of independence from the ruling regime (Lührmann et al., 2017, p. 13). The reliability of the indicator is increased by the definition of stable coding rules over time and across countries, and the use of multiple coders, including native coders (Coppedge et al., 2016, pp. 581f.). V-Dem considers rules in use. Data are available and comparable across countries and over time. One critical point is that the index relies exclusively on expert evaluations and codings from V-Dem.

Lührmann et al. (2017, p. 58) have estimated a hierarchical Bayesian factor model to summarise their indicators and consider hierarchical relationships between variables. Their model assumes that vertical accountability is a direct function of the components and presence or absence of vertical accountability (Lührmann et al., 2017, p. 59). Indicators of accountability, via political parties, are treated as hierarchically nested within the overall model (Lührmann et al., 2017, p. 59). Consequently, political systems without elections are characterised by a lower degree of vertical accountability than countries with elections, regardless of the role of political parties. Overall, the aggregation rule confirms the underlying concept.

6.2.10 Horizontal accountability

Horizontal accountability refers to the separation of powers between the legislative, executive, and judicial branches. It is defined as oversight of the elected authorities by relatively autonomous political institutions (Merkel, 2016, p. 462; Merkel, 2004, pp. 40f.). Few approaches to measuring horizontal accountability provide comparable data for global comparative analyses (Lührmann et al., 2017, p. 10). The present study captures the separation and interdependence of powers, using Lührmann et al.'s (2017) Horizontal Accountability Index, based on Coppedge et al. (2017a). The Voice and Accountability indicator included in the World Bank Governance Indicators focuses on vertical accountability and political rights. Several studies have used Henisz's (2002) measures of veto-player influence to capture horizontal accountability. While the two concepts overlap, this study examines their importance to climate commitment and performance separately. Chapter A6.5 in the annex discusses the validity and reliability of the Rule of Law indicator from the Worldwide Governance Indicators and *exconst* from Polity IV. In their democracy measurement, Lauth and Kauff (2012, p. 15) use the Rule of Law indicator included in the World Bank Governance Indicators as an indicator of the control dimension of democracy. Neither in its conceptualisation nor in its measurement does it consider other elements of horizontal accountability. The concept of the Polity IV *exconst* indicator provides a measurement characterised by overinflation. Moreover, its reliance on a single indicator reduces reliability.

The Horizontal Accountability Index is characterised by concept validity in the conceptualisation phase. It performs well with regard to transparency, concept specification, and logic. Lührmann et al. (2017) consider all relevant dimensions of horizontal accountability. They define horizontal accountability as the 'capacity of state institutions such as legislatures and the judiciary to oversee the government by demanding information, questioning officials and punishing improper behaviour' (Lührmann et al., 2017, p. 4). The components and sub-components of their concept, as well as their vertical and horizontal interrelationship, are specified. Following O'Donnell (1998) they assume that the extent of horizontal accountability depends on the ability of the legislature, judiciary, oversight agencies, ombudsmen, and prosecutor generals to monitor government behaviour and impose sanctions (Lührmann et al., 2017, p. 7). They identify three types of political institutions that exercise control over the government: the legislature, the judiciary, and political institutions specifically created for this purpose, such as oversight agencies (i.e. the general prosecutor and ombudsmen) (Lührmann et al., 2017, p. 13). They regard all three forms of horizontal accountability as being of equal importance (Lührmann et al., 2017, p. 13). The inclusion of political institutions that exercise control over the government, beyond the executive, legislative, and judicial branches, is plausible. It is coherent and not characterised by overinflation or redundancy. It is distinguished from related concepts and applies to all political systems (see previous section).

The Horizontal Accountability Index is relatively valid and reliable in the measurement phase as well. In accordance with its conceptualisation, its measurement approach considers the legislature, judiciary, and oversight agencies that constrain the executive branch (Coppedge et al., 2017b, p. 77). With regard to the legislature, the focus reflects a definition of accountability: whether the parliament is able to demand information from the government or to sanction illegal or unethical behaviour by the government (Lührmann et al., 2017, p. 14). The index measures the existence of a legislature by the extent to which the parliament is able to exercise control over the government by asking questions, and the extent to which the legislature can investigate illegal or unethical government activity and decide against the government (Lührmann et al., 2017, p. 14). Judiciary oversight of the government is measured using five indicators: higher and lower court independence from government, government compliance with important higher and lower court decisions, and whether the government acts in accordance with the constitution (Lührmann et al., 2017, p. 14). The extent to which other state institutions control the government is captured by an indicator that measures whether other state institutions are likely to investigate and report potential illegal or unethical government behaviour (*v2lgotovst*) (Lührmann et al., 2017, p. 14). The Horizontal Accountability Index indicators perform well in relation to content validity. They are valid measures that consider the whole concept. The index also provides reliable data. As the previous section explains, the data are derived from expert evaluations carried out by native and international experts. Reliability is increased by the reliance on multiple coders. They are also comparable across countries and over time. The index relies exclusively on V-Dem data (see Section 6.2.8).

The Horizontal Accountability Index is based on a hierarchical Bayesian structural equation model with four components: an independent investigative institution, a government that considers the constitution, and independent judicial and legislative branches that can act against the wishes of the government (Lührmann et al., 2017, p. 61ff.). It does not use factor analyses because some accountability measures assume hierarchical relationships between the elements of underlying concepts (Lührmann et al., 2017, p. 58). The model assumes direct effects on accountability of the extent to which an independent investigative body exists, and the extent of a government's acceptance of the constitution (Lührmann et al., 2017 p. 63). It models the extent of legislative accountability as a function of the presence or absence of a legislative branch. In this way, it considers the assumption that political systems without legislatures should have lower accountability values than systems with legislatures. Finally, it models

judicial oversight over the government as a nested latent variable (Lührmann et al., 2017, p. 62f.). In sum, Lührmann et al. (2017)'s aggregation level and rule are transparent and in line with their concepts.
To conclude, the underlying concept of the Horizontal Accountability Index confirms the common understanding of accountability. It also shows reliability in the measurement phase. Its indicators are characterised by content validity. It considers both rule of law and rules in use. The resulting index is available and comparable for most countries since 1900. The aggregation phase is also characterised by validity.

6.2.11 Political rights

There are insufficient indicators on political rights for global comparative analyses. The only indicator that focuses exclusively on the dimension of political rights is Lührmann et al.'s (2017) V-Dem Diagonal Accountability Index. This section discusses its validity and reliability in the three phases of index construction.
The underlying concept of the Diagonal Accountability Index presents no validity problems in the conceptualisation phase, as an indicator of political rights. It is distinguished from related concepts. Lührmann et al. (2017, pp. 4f.) have identified a third dimension of accountability by including diagonal accountability, alongside vertical and horizontal accountability. They define diagonal accountability as the 'extent to which citizens are able to hold a government accountable outside of formal political participation' (Lührmann et al., 2017, p. 15). The assumption is that governments can be held accountable to citizens outside formal forms of political organisation (elections and political parties) by civil-society organisations and the media, via monitoring and influencing government behaviour (Lührmann et al., 2017, p. 8). This concept explains the horizontal and vertical relationship between the components and sub-components. The dimensions of diagonal accountability include freedom of expression, civil society, citizen engagement in politics, and media freedom (Lührmann et al., 2017, p. 15). The concept of diagonal accountability confirms Merkel's (2016, 2004) conceptualisation of political liberties. While it does not consider freedom of association, it includes a similar variable: civil engagement in politics.[68] The concept presents no problems related to redundancy or conflation. It applies to many types of political systems.
The Diagonal Accountability Index performs well in the measurement phase. It captures the underlying concept of diagonal accountability completely and its indicators are characterised by content validity. Media freedom is first measured by indicators of the extent to which government actions undermine media freedom. They consider the extent of media censorship by the government and censorship on the Internet (Lührmann et al., 2017, p. 15). This is also captured by the availability of neutral media (Lührmann et al., 2017, p. 15). Finally, the index includes indicators related to critical reporting on the government, equal reporting on opposition candidates, multiple political perspectives in the media, and the presence of self-censorship on issues relevant to the government (Lührmann et al., 2017, p. 15). The importance of civil society is measured by indicators that consider popular and voluntary participation in civil-society organisations, government control over the entry and exit of civil-society organisations in public life, and government oppression of civil-society organisations (Lührmann et al., 2017, pp. 15f.). Freedom of expression is captured by freedom of expression in private discussion on political matters by women and men without government oppression or cultural restrictions, and freedom of academic and cultural expression (Lührmannet al., 2017, p. 16). An item that evaluates the inclusion of citizens in public deliberations is used as an indicator of citizen engagement in politics (Lührmann et al., 2017, p. 16). Finally, the Diagonal Accountability Index offers comparable for my research period and country sample. V-Dem also offers the disaggregated indicators. However, the measure relies only on V-Dem data.
Lührmann et al. (2017) use hierarchical Bayesian structural equation analysis to aggregate their indicators to their summary measures. They do not use factor analysis as they assume hierarchical relationships between the elements of their underlying concepts (Lührmann et al., 2017, p. 58). Diagonal accountability is regarded as a function of media freedom, freedom of expression, civil society and citizen engagement in politics (Lührmann et al., 2017, pp. 15, 64). Media freedom, freedom of expression and civil society are modelled as latent variables, measured by multiple indicators (Lührmann et al., 2017, p. 64). Citizens engagement in politics is measured by only one indicator (Lührmann et al., 2017, p. 64). Their aggregation level and rule confirms their concept of diagonal accountability. They also explain in detail their aggregation approach (reliability).
In sum, the diagonal accountability index from Lührmann et al. (2017) performs well in the three phases of index construction. While it does not consider freedom of association, it includes an indicator of civil society participation.

[68] V-Dem offers, with the Freedom of Association (thick) index, a summary measure that considers freedom of association. In addition to civil-society organisational indicators, it also considers indicators related to the vertical-accountability dimension (the right to form and participate in political parties). For this reason, it does not represent an alternative to the diagonal accountability index.

6.2.12 Civil rights

I capture civil rights by the Equality before the law and individual liberty index from Coppedge et al. (2017) and Pemstein et al. (2017). The Civil Liberties measure from Freedom House and the World Bank Governance Indicator Rule of Law that have often been applied in earlier studies show validity problems in all three phases of index construction (see Chapter A6.6 in the annex).[69] Their underlying concepts are too maximalist. Simultaneously, the Rule of Law measure omits relevant elements of civil rights. Indicators from both measures have problems with content validity and are not comparable over time. Their aggregation rule is not explained.
The following section explains that the V-Dem measure is a valid and reliable indicator of civil rights and offers comparable data across countries and over time. Following Merkel (2016, p. 264; Merkel, 2004, pp. 39f.) civil rights refer to constitutional rights that protect the individual against the state and other individuals; they include equal treatment under the law, equal and fair access to independent courts, and the rule of law. The Equality Before the Law and Individual Liberty Index aims to measure '[t]o what extent are laws transparent and rigorously enforced and public administration impartial, and to what extent do citizens enjoy access to justice, secure property rights, freedom from forced labour, freedom of movement, physical integrity rights, and freedom of religion?' (Coppedge et al., 2017a, p. 60). The concept, therefore, considers all relevant elements of civil rights; it presents no problems with regard to concept specification or logic. It also performs well in the measurement phase. It is based on 14 V-Dem items, evaluated by multiple experts, including native scholars and professionals. The indicators are characterised by content validity and cover the civil-rights concept. They consider the following: equal access to justice and rigorous and impartial public administration; transparent laws with predictable enforcement; freedom from forced labour, torture, and political killings; freedom of religion and movement; and property rights. This index is available and comparable across the countries in the sample during the research period. However, it is based only on expert evaluations and a single data source (V-Dem). All indicators of the V-Dem measure are converted to an interval scale by a measurement model. The summary measure results from a Bayesian factor analysis model, based on the indicators described above. The aggregation rule confirms the underlying concept. The category associational and organisational rights are weighted lower than the other categories, which include only three indicators.

6.3 Control hypotheses and variables

To ascertain the relative importance of the interrelationship between international integration and domestic politics, the statistical analyses control additional variables, which have been applied in similar studies. This chapter formulates and operationalises control hypotheses. Comparative climate and environmental policy research encompasses political (political-institutional and party-difference theory), social (power-resource theory), economic (functionalism) and international (globalisation and European integration research) explanatory approaches (e.g., Tosun, 2015, pp. 648–655). In addition, scholars have examined the importance of natural determinants (e.g., Jahn, 2013b; Neumayer, 2002b). Comparative climate and environmental foreign-policy research has considered international (system), political (state-centric), and social (societal) approaches (Barkdull & Harris, 2002). Alongside corruption and international economic integration, economists have examined the influence of economic development and demographic variables. In sum, international, political, economic, social, institutional, and natural factors that explain cross-national variation in climate commitment and performance can be distinguished. Within the present explanatory model (see Chapter 5), these variables are regarded as context factors of government behaviour.

6.3.1 Economic controls

Economic activities are an important source of CO_2 emissions. The theoretical and empirical literature is unclear with regard to the direction and function (linear or curvilinear) of the effect of the level of **economic development**. Early economic and political science studies predicted a positive linear effect of economic development (via the scale of economic activity) on pollution when there were no changes in technologies or factor-inputs and -outputs (the prosperity-pollution hypothesis) (Jahn, 2016a, p. 17f.; Stern, 2004, p. 1421; Tosun, 2015, p. 648). The prosperity-cleaning-up hypothesis argues that rich countries are more committed to climate protection and perform better in greenhouse gas emissions reductions (Jahn, 2016a, p. 172). They have more resources and a higher regulatory and technical capacity to implement environmental policies (Wheeler, 2001, p. 234). Income and education also enable local communities to address environmental problems (Wheeler, 2001, p. 234). Poor countries use their scarce resources for environmental protection only after improvements have been made in other policy areas (e.g., public health) (Wheeler, 2001, p. 234). Following the empirical findings of an inverted U-shaped relationship

[69] Gallego-Alvarez et al. (2014) apply the Voice and Accountability World Bank indicator to consider civil rights (see Section A6.2.8 in the annex).

between GDP per capita and environmental degradation, EKC theory assumes that environmental pollution rises with per capita income but levels off and declines after a pollutant-dependent threshold has been reached (Stern, 2004, p. 1419). In the early stages of economic development, the pollution-intensive industry sector becomes more important (the composition effect), relative to the less pollution-intensive agricultural sector (Stern, 2004, p. 1421). In later stages, the shift from a pollution-intensive industry sector to the service sector contributes to a decline in environmental pollution. To explain the inverted U-shaped relationship, scholars have also emphasized the shift from pollution-intensive to more environmentally friendly inputs, changes in output structure, international trade, the use of more environmentally friendly technologies, and the outsourcing of pollution-intensive production to poorer countries, as well as environmental attitudes (Arrow et al., 1995, p. 520; Dauvergne, 2017, p. 398; Li & Reuveny, 2006, p. 942; Stern, 2004, p. 1421, 1423; Torras & Boyce, 1998, p. 149f.; Van Alstine & Neumayer, 2008, p. 50; Wheeler, 2001, p. 234f.), political and civil rights (Li & Reuveny, 2006, p. 942; Torras & Boycle, 1998), and environmental policy (Dauvergne, 2017, p. 398; Torras & Boyce, 1998, p. 149).

Most empirical studies have tested the effect of GDP per capita and its squared form on pollution levels (the 'reduced form' of the EKC) (Torras & Boyce, 1998, p. 149; Wheeler, 2001, p. 235). There is no clear support for the different theoretical perspectives (see also Jahn, 2016c, p. 682) (e.g., Bättig & Bernauer, 2009; Esty, 2011, p. 161a; Galeotti et al., 2006; Jensen & Spoon, 2011, p. 110; Li & Reuveny, 2006; Liddle, 2015; Spilker, 2013). Empirical research confirms the importance of studying economic development and CO_2 emissions separately in developed and developing countries. There is some indication that the inverted-U shaped relationship does not apply to global pollutants (e.g., CO_2 emissions) (Gallagher, 2009, p. 11; see also Arrow et al., 1995, p. 520; Dauvergne, 2017, p. 401; Stern, 2004, p. 1423). Governments may be more willing to address local pollution (Arrow et al., 1995, p. 520; Torras & Boyce, 1998, p. 148). In addition, differences between developed and developing countries can be assumed. Based on the EKC, these are likely to undermine climate performance in poor economies ($H_{cont}1a$). It is unclear whether economic development has a positive or negative effect on climate performance in developed countries ($H_{cont}1b$). By contrast, economic development might support a country's commitment to climate cooperation in developed countries ($H_{cont}1c$). As discussed above, climate concerns are more prevalent among residents of high-income countries. Thus, the higher the level of economic development, the higher the level of climate commitment. This study measures a country's level of economic development using the standard indicator – GDP per capita – to control population size (Babones, 2007, p. 150). GDP per capita in purchasing-power parity (PPP) is better at capturing the standard of living than market prices or official exchange rates (Babones, 2007, p. 151). To test a curvilinear effect, the natural logarithm of GDP per capita has been mean-centred to avoid problems with multicollinearity; its squared term has been added to the regression models. The curvilinear effect is not tested in the analysis of climate commitment (Neumayer, 2002a, p. 150, footnote). EKC theory mainly refers to the relative size of the agricultural and industry sectors. The empirical models control for **economic growth,** based on annual GDP-growth data in %. Rapid economic growth is harmful for the environment (e.g. Böhmelt et al., 2016). In times of low economic growth, state and private investments in environmentally friendly technologies may be lower (Dauvergne, 2017, p. 398). Governments are less likely to join especially hard climate treaties in times of economic decline. Thus, economic growth is likely to undermine climate commitment and performance ($H_{cont}10$). Data on GDP per capita (The World Bank Group, 2016b) and GDP growth (The World Bank Group, 2017a) comes from the World Bank's Development Indicators.

Various empirical studies have considered the size of particular economic sectors (e.g., Garmann, 2014). Industry is more pollution-intensive than agriculture or the service sector (Cao & Prakash, 2010, p. 489). Industry-sector representatives and workers tend to oppose climate change mitigation efforts (Sprinz & Vaahtoranta, 1994, pp. 104f.; Ward, 2008, p. 393). Thus, the **size of the industry sector** undermines a government's willingness to commit to climate cooperation and undertake climate change mitigation efforts ($H_{cont}2$). The present study controls for industry-sector size, measured by the percentage of GDP produced by the industry sector (see also Ward, 2008, p. 393). In accordance with previous research, this study also controls the percentage of fuel exports in merchandise exports (e.g., Cao & Prakash, 2010). High levels of **fossil fuel exports** can make it harder for governments to shift to climate-friendly energy resources (Povitkina, 2018, p. 419). Fossil-fuel production contributes directly to emissions and increases reliance on fossil fuels in the domestic economy (Neumayer, 2002c, p. 7). Moreover, representatives of the fossil fuel industry generally oppose climate protection (Povitkina, 2018, p. 419) and participation in climate treaties ($H_{cont}3$). Data on the size of fossil fuel exports and the industry sector come from the World Bank (The World Bank Group, 2016c,d).

6.3.2 Social controls

Numerous studies have examined the influence of **ENGOs** on climate commitment and performance. ENGOs contribute to climate cooperation, spread norms, provide assistance in the design and implementation of environmental policies, and reduce uncertainty by informing and monitoring state commitment and behaviour (Böhmelt et al., 2015, p. 93; Raustiala, 1997, pp. 728f.). They indirectly support climate commitment and performance through public mobilisation, boycotts, demonstrations, the circulation of research results, court rules, and support

for environmentally friendly political candidates and parties (Binder & Neumayer 2005, p. 529f.; Connelly & Smith, 1999, p. 78). The number of members and financial resources of ENGOs (ENGO strength) is decisive (Binder & Neumayer, 2005, p. 530). ENGOs may have more impact on government responses to local, rather than global, environmental problems because it is easier to mobilise public support for environmental problems with direct effects on human health (Binder & Neumayer, 2005, p. 530; Harrison & Sundstrom, 2010a, p. 9). Accordingly, the influence of ENGOs is thought to be higher in countries that are more impacted by global warming (Harrison & Sundstrom, 2010a, p. 9). Finally, the positive effect is clearer in relation to commitment, rather than performance. It is harder to monitor the implementation of climate policies. While case studies confirm that ENGO strength contributes to environmental protection, quantitative findings are ambiguous (e.g., Scruggs, 1999, p. 29). Thus, this book assumes a positive association with climate commitment and performance ($H_{cont}4$). The effect should, however, be more prevalent in relation to the ratification of climate treaties. This study controls for the annual number of ENGOs present in a country (see also Fredriksson & Ujhelyi, 2006; Fredriksson et al. 2007). The higher the number of ENGOs, the higher their influence. However, a smaller number of ENGOs may be better organised and more effective (Böhmelt et al., 2015, p. 106; Fredriksson & Ujhelyi, 2006, p. 18, footnote). This study applies data derived from Bernauer et al. (2013a) on the number of ENGOs per country, registered with the International Union for Conservation of Nature (IUCN). The IUCN is an umbrella organisation that supports conservation and biological diversity within countries (Böhmelt et al., 2015, p. 105). This measure does not consider all domestic ENGOs, as membership in the IUCN is not obligatory (Bernauer et al., 2013b, p. 105). It may also include some international ENGOs (Böhmelt et al., 2015, p. 105, footnote; Bernauer et al., 2013b, p. 98, footnote). Bernauer et al. (2013b, p. 98) have stated that other data sources include fewer ENGOs and countries. I have logarithmised the number of ENGOs to reduce positive skewness (see also Böhmelt et al., 2015, p. 106, footnote). Comparative environmental and climate policy research has examined the importance of **corporatism** in environmental performance (e.g., Crepaz, 1995; Jahn, 1998; Neumayer, 2003; Scruggs, 1999, 2001, 2003) (Tosun, 2015, p. 649). Corporatism describes an interest-group arrangement characterised by centralised societal interest groups (capital and labour), interest-group/government cooperation in policymaking, and consensual policy decisions (Dolšak, 2001, p. 419; Jahn, 2016a, p. 172; Jahn & Wälti, 2007, p. 3). In pluralist interest-group arrangements, interest groups vary over time and have a lower degree of cooperation (Christoff & Eckersley, 2011, p. 440). On the one hand, centralised organised interests (Wenzelburger & Neumann, 2015, p. 257), information distribution and use, flexibility and learning, the consideration of multiple interests in the policymaking process (Scruggs, 2003), and long-term interest-group arrangements, together with a focus on consensual decisions, contribute to climate protection in corporatist systems (Christoff & Eckersley, 2011, p. 440). Varying interests over time and little cooperation among interest groups undermine climate-policy efforts in pluralist systems (Christoff & Eckersley, 2011, p. 440; Poloni-Staudinger, 2008, p. 412; Strøm & Swindle, 1993, p. 7). On the other hand, industry and labour representatives have more influence on policymaking than ENGOs in corporatist systems (Dolšak, 2001, p. 419; Matthews, 2001, p. 408; Poloni-Staudinger, 2008, p. 412; Strøm & Swindle, 1993, p. 7). Previous research on climate performance has produced different findings (Neumayer, 2003; Jahn, 2008). I use Siaroff's (1999, p. 184) summary measure of corporatism (see also Jahn, 2008; Neumayer, 2003). Given the available data, corporatism is controlled in the analysis of climate performance only in relation to developed countries. Overall, the effect of corporatism on climate outcomes in high-income countries is ambiguous ($H_{cont}5$).

6.3.3 Demographic controls

Most empirical studies of climate performance (e.g., Li & Reuveny, 2006) control for demographic variables. First, population growth is presumed to be positively associated with greenhouse gas emissions (Li & Reuveny, 2006, p. 943) ($H_{cont}6a$). It contributes to pollution via consumption (Ward, 2008, p. 393) and is regarded as a primary explanatory factor of greenhouse gas emissions (Christoff & Eckersley, 2011, p. 434). It does not necessarily affect climate commitment ($H_{cont}6b$). The ecological vulnerability of citizens in densely populated countries (population density, i.e. the ratio of population and land area) tends to increase public support for climate protection (Jahn, 2016c, p. 684; Scruggs, 2003, p. 73; Ward, 2008, p. 393), thus contributing to climate commitment and performance ($H_{cont}7a$). Li and Reuveny (2006), however, have found a significant positive effect of population density on CO_2 emissions. The larger and less densely populated a country, the longer it takes to transport goods and services (Jahn, 2016c, p. 684). For this reason, governments in countries with low population density may be more reluctant to ratify and implement climate agreements ($H_{cont}7b$). Finally, urban regions are associated, via consumption, with natural greenhouse emissions and greenhouse emission levels (Arvin & Lew, 2011, p. 1154). Yet, public transportation systems, smaller houses, and the use of natural gas can contribute to lowering greenhouse gas emissions in urban areas (Makido et al., 2012; Povitikina, 2018; Timmons et al., 2016). Thus, it is an empirical question whether urban populations contribute to or undermine climate performance ($H_{cont}8a$). Urbanisation may contribute to climate commitment. Urban citizens tend to be more aware and concerned about global warming ($H_{cont}8b$). Statistical analyses therefore test multiple World Bank indicators (The World Bank Group, 2016e, 2017b, c), including population growth, population density, and urban population. In relation to model

complexity, the present study does not consider the three demographic factors using all statistical models. In relation to model development, the most important demographic variable for the dependent variable is considered. Other variables are controlled in the robustness analysis of the final model.

6.3.4 Natural controls

Natural explanatory factors include 'differences in the climatic conditions, the availability of renewable and fossil energy resources and the transportation requirements' (Neumayer, 2002b, p. 7). Empirical research has shown that climate conditions and energy resources help to explain CO_2 emissions per capita (Neumayer, 2002b; Jahn, 2003). Their relative explanatory power is low (Neumayer, 2002b). This study considers country size because it is associated with transportation (Neumayer, 2002b, p. 7, see previous section regarding measurement) and is therefore likely to undermine climate performance ($H_{cont}9$). The robustness analysis of climate performance in developed countries controls the index of heating degree months (HDM index), derived from Jahn (2013b, c). The HDM index captures the average national heating degree by month using 'the difference of the base temperature to the actual monthly temperature for each region, weighting it by the regional population' (Jahn, 2013b, p. 101). Below the base temperature, heating in buildings is needed (Jahn, 2013b, p. 98). Countries with colder average temperatures are associated with more heating and, therefore, higher emissions (Jahn, 2013b, p. 97; Neumayer, 2002b, p. 7). Higher average temperatures may also be associated with high emissions because they require more cooling (Jahn, 2013b, p. 108; Neumayer, 2002b, p. 7). Jahn (2013b, p. 98) uses 15 Celsius as a base temperature. Since cooling is also associated with energy consumption, I have estimated the same models, using the respective Cooling Degree Months (CDM) index (Jahn, 2013c). Thus, higher and lower national average temperatures are likely to undermine climate performance ($H_{cont}10$). Unfortunately, there are no available data for developing countries. Therefore, these variables are only considered in the analysis of climate outcomes in developed countries.

6.3.5 International controls

The literature studies the influence of member states on **EU** environmental policy and the effect of adoption of EU environmental policy by member states (Tosun, 2015, p. 652). In contrast to other IGOs, the EU can coerce member states to follow its climate policies. The EU has been very active in climate protection. It represents its member states in the international climate-treaty negotiations. Moreover, it describes itself as a leader in domestic and global environmental protection on the national and international level (Lenschow & Spungk, 2010, p. 134). Schreurs and Tiberghien (2007, 2010) have argued that the ratification of the Kyoto Protocol resulted from a combination of competitive, mutually reinforcing factors, including the support of the European presidencies, Commission, and Parliament, and the adoption of the burden-sharing approach. Jahn (2008) has shown that EU member states are associated with lower overall (as well as industry) CO_2 emissions. EU membership should contribute to climate commitment and climate performance (of developed countries) ($H_{cont}11$). In the analysis of the Kyoto Protocol, EU members are treated as a single country, as they entered the climate treaty together.
Dobbin et al. (2007, p. 459) have emphasized the importance of controlling multiple diffusion mechanisms. International climate cooperation is only successful if many countries join international agreements. Thus, countries are more likely to ratify the UNFCCC and Kyoto Protocol when other countries have ratified them (Harrison & Sundstrom, 2010a, p. 5). This study controls for the likelihood of ratification when countries within the same region have signed on to the agreement. **Regional climate commitment** is captured by the percentage of countries that have ratified the UNFCCC or Kyoto Protocol within a year. Policies to reduce greenhouse gas emissions may also diffuse across regions. In the climate performance analysis of developing countries, I consider the average climate performance of countries from particular regions, applying the IIASA (2004) classification of regions. The analysis of developed countries relies on the family of nations concept (Castles, 1993). Regional commitment and performance are likely to contribute to climate commitment and performance ($H_{cont}12$).

6.3.6 Political controls

Political parties in parliament and government may differ in their climate policies (see Chapter 4). The database makes it possible to control left, right, centre, and left-libertarian party strength in parliament when analysing climate performance in developed countries (see Section 6.2.6). On the left/right dimension, left-wing-party strength in parliament is associated with significantly higher climate commitment and performance levels than right-wing party or centre-party strength ($H_{cont}13a$). Centre parties should contribute more to the ratification of climate treaties and the reduction of greenhouse gas emissions than right parties ($H_{cont}13b$). On the green/growth dimension, green and left-libertarian parliament seats contribute to both dimensions of state participation in climate cooperation ($H_{cont}14$).
Numerous studies of cross-national difference in environmental commitment (e.g., Böhmelt et al., 2015) and performance (e.g., Bernauer & Koubi, 2009) have examined the importance of **electoral rules**. As plurality systems are associated with a larger winning coalition than proportional representation (PR) systems (Bueno de Mesquita

et al., 2003, p. 54), they tend to provide more environmental public goods to secure voter support (see also Milesi-Ferreti et al., 2002). On the other hand, many scholars expect PR systems to perform better in relation to climate and environmental protection (e.g., Fredriksson & Millimet, 2004; Fredriksson & Wollscheid, 2007, pp. 382f.; Harrison & Sundstrom, 2010b, p. 272; Persson et al., 2007; Persson & Tabellini, 1999). First, plurality elections imply that politicians focus on the local environmental problems of a few 'marginal districts' (Persson & Tabellini, 1999, p. 703; see also Fredriksson & Millimet, 2004, pp. 237f.; Persson & Tabellini, 1999, pp. 703, 713f.). Political candidates and parties in PR systems depend on support from citizens in all districts (Fredriksson & Millimet, 2004, pp. 237f.). The median voter favours environmental protection (Fredriksson & Millimet, 2004, pp. 237). Second, while plurality electoral rules favour large party factions in parliament and single-party governments (Persson et al., 2007, pp. 169ff.), PR rules contribute to a better representation of diffuse interests (e.g., climate protection), making it more likely that new and small parties will gain seats in parliament (see also Fiorino, 2011, p. 378; Harrison and Sundstrom, 2010b, p. 272). Third, coalition governments in PR systems are more likely to provide more public goods, given that voters are able to distinguish between the policy preferences of government parties (Persson et al., 2007, pp. 164f.). Finally, industry interest groups have more political influence in plurality systems (Fredriksson & Millimet, 2004, p. 238). Case studies have shown that democracies with PR electoral rules have contributed to Kyoto Protocol ratification and climate change mitigation (e.g., Crowley, 2007, p. 127; Harrison & Sundstrom, 2010a; 2007, p. 9). PR systems have enabled green parties to influence climate commitment in Australia (Crowley, 2007), Europe, and Japan (Harrison & Sundstrom, 2010a, pp. 3f., 10). Thus, PR electoral rules are likely to be associated with higher levels of climate commitment and performance, in contrast to plurality systems ($H_{cont}14$). These electoral regime data are drawn from the World Bank Database of Political Institutions 2015 (Cruz et al., 2016a). The dichotomous variable '*Plurality'* classifies a country as plurality system, if 'legislatures are elected using a winner-take-all/first past the post rule' (Cruz et al., 2016b, no page number). The variable '*PR'* classifies countries with parliaments based on vote shares as proportional representation (Cruz et al., 2016b, no page number). Both variables are missing if there is no legislature, the legislature is unelected, there is only one candidate, or there is no clear competition in an elected legislature in a single-party system (Cruz et al., 2016b, no page number).

The academic literature discusses the **vulnerability of countries to climate change** as an explanatory factor in climate commitment and state efforts to mitigate global warming (e.g., Dolšak, 2009; Tubi et al., 2012). Tubi et al. (2012, p. 473) distinguish between two dimensions of country vulnerability: climate change impacts, i.e. ecological and socio-economic consequences; and a country's technological, institutional, and educational capacity to adapt to global environmental change. According to neoliberal institutional (e.g., Roberts et al., 2004) and state-centric foreign-policy theory (Sprinz & Vaahtoranta, 1994), countries that face considerable impacts of global warming and are characterised by a low adaption capacity are likely to support climate cooperation (Sprinz & Vaahtoranta, 1994, pp. 79f.; Tubi et al., 2012, p. 475f.). In addition, citizens in such countries may demand climate policies from their politicians (Dolšak, 2009, p. 560). Vulnerable countries are likely to prefer climate change adaptation policies over climate change mitigation (Tubi et al., 2012, p. 476). At the same time, they can only make credible demands on other countries to reduce greenhouse gas emissions if they also implement such policies (Dolšak, 2009, p. 560). Heggelund et al. (2010, p. 237) have argued, based on the empirical literature, that vulnerability cannot explain a country's performance. National discourses on climate change are often independent of climate change vulnerability (Christoff & Eckersley, 2011, p. 445). In sum, there is no clear effect of climate vulnerability on climate commitment and performance ($H_{cont}15$). This study measures climate change impacts using Bättig et al.'s (2007) climate change index in Bättig and Bernauer (2009). This index rates climate variability caused by global warming, rather than natural developments, on a scale from 0–1. Higher values indicate higher climate variability. With regard to a country's capacity to adapt to climate change, this study controls for economic development, i.e. GDP per capita (see Section 6.3.1).

In the pooled analysis of UNFCCC and Kyoto Protocol ratification, **Annex I status** is included as an independent variable (see Section 6.1). Annex I parties to the climate regime tend to be more reluctant than Non-Annex I parties to ratify international climate agreements because they have higher compliance costs, reducing their economic competitiveness in comparison to developing countries (Downs et al., 1996; Harrison & Sundstrom, 2010a, pp. 5, 14) ($H_{cont}16$). This does not apply to the UNFCCC, which is associated with few costs for Annex I and Non-Annex I parties.

More recently, publications have studied the relationship between **types of autocracy** and environmental performance (e.g., Ward et al., 2014; Wurster, 2013). Based on the assumption that political stability and political competition contribute to the implementation and effectiveness of long-term and sustainable environmental policies (e.g., Gandhi & Przeworski, 2007; Ward et al., 2014, p. 319; Wurster, 2013, p. 79), Wurster (2013, pp. 79ff.) argues that civilian autocracies are likely to perform better in climate change mitigation than monarchies and military dictatorships. First, they stay in power long than military autocracies (Ward et al., 2014, p. 319; Wurster, 2013, p. 80). Second, civilian autocracies are characterised by a higher degree of competition (Wurster, 2013, p. 80) and stability, which make them less likely to become 'stationary bandits' (see also McGuire & Olson, 1996,

p. 48; Pellegrini & Gerlagh, 2006, p. 334). Moreover, monarchies (Wurster, 2013, p. 89) and military regimes have smaller winning coalitions. Mattes and Rodríguez (2014, p. 527) have argued that, since the political institutions of personalist and military autocracies contribute to accountability, transparency, and flexibility, they are more likely to cooperate at the international level. In sum, differences in climate commitment and performance among autocracies constitute an empirical question ($H_{cont}17$). While Ward et al. (2014) have found no significant differences among autocratic regimes (military, monarchy, personalist, single party) in relation to CO_2 emissions, Wurster (2013, p. 86) has observed a significant positive effect of monarchies on global air pollution. The present study applies data from Cheibub et al. (2010, 2009) to consider differences between civilian, military, and royal dictatorships. The annex discusses the validity and reliability of different approaches to measuring autocratic regime types (see Chapter A6.7).

6.4 Treatment of missing values

The selection criteria used in the operationalisation of independent and dependent variables were data availability and comparability for selected countries during the complete research period. Unfortunately, missing data are still present in the data. This chapter explains the treatment of missing values and cases. Macro-comparative research uses interpolation and mean values of available cases to deal with missing values (Lauth et al., 2009, p. 92; Roller, 2005, p. 143). Interpolation may bias parameter estimates in TSCS, as it contributes to linearity in the data (Beck & Katz, 2015, pp. 65f.; Pennings et al., 2006, p. 66; Wolf, 2015, p. 109, footnote). This study applies cross-sectional OLS regression. This study follows the approach of Roller (2005, p. 143f.). Missing values between two country-years have been estimated based on a linear regression (1). In the case of missing country-years at the beginning or end of the research period (independent variables: 1991–2005, dependent variables: 1992–2006) the missing values have been estimated, based on the long-term linear trend (linear regression) (2). With regard to completely missing cases, I have used the average of available and estimated values related to the country's family of nations (Castles, 1993) (developed Annex I countries) or world region (IIASA, 2004) (all other countries) (3). In the following cases, these approaches have not been applied. Completely missing cases have only been with the average values of the country family/world region in the case of independent variables. Countries for which climate performance is completely missing have been excluded from the analysis. Second, missing values related to veto-point and player variables have not been estimated based on linear regression or replaced by average values. The assumption of a linear development underlying linear regression is problematic for these variables (Roller, 2005, p. 145). Countries missing a maximum of five country-years have only been assessed on these variables. Third, for some countries, data on trade relationships (exports and imports in commodities) were not available for all years of the research period (1991–2005). In most countries, the most important trading partners were relatively stable over time. Therefore, missing values were replaced with trading-partner data from the last available year. When earlier data on trade relationships were missing, the missing years were replaced with values from the next available year.

References

Armingeon, Klaus, Christian Isler, David Weisstanner, and Laura Knöpfel. 2015. Supplement to the comparative political data set – Government composition 1960-2013. Bern: Institute of Political Science, University of Berne. http://www.cpds-data.org/index.php/data, Accessed 5 Jul 2016.

Arrow, Kenneth, Bert Bolin, Robert Costanza, Partha Dasgupta, Carl Folke, C. S.[70] Holling, et al. 1995. Economic growth, carrying capacity, and the environnment. *Science* 268:520–521.

Arvin, Mak B., and Byron Lew. 2011. Does democracy affect environmental quality in developing countries? *Applied Economics* 43(9), 1151–1160.

Babones, Salvatore J. 2007. Studying globalization: Methodological issues. In *The Blackwell companion to globalization*, ed. George Ritzer, 144–161. Malden et al.: Blackwell Publishing.

Baek, Jungho, Yongsung Cho, and Won W. Koo. 2009. The environmental consequences of globalization: A country-specific time-series analysis. *Ecological Economics* 68(8-9):2255–2264.

Bättig, Michèle B., and Thomas Bernauer. 2009. National institutions and global public goods: Are democracies more cooperative in climate change policy? *International Organization* 63(2):281–308.

Bättig, Michèle B., Martin Wild, and Dieter M. Imboden. 2007. A climate change index: Where climate change may be most prominent in the 21st century. *Geophysical Research Letters* 34(1):1–6.

Barkdull, John, and Paul G. Harris. 2002. Environmental change and foreign policy: A survey of theory. *Global Environmental Politics* 2(2):63–91.

Bartolini, Stefano. 2000. Collusion, competition and democracy: Part II. *Journal of Theoretical Politics* 12(1):33–65.

Beck, Nathaniel, and Jonathan N. Katz. 2015. Modeling dynamics in time-series-cross-section political economic data. In *Quantitative Research in Political Science (IV)*, ed. Robert J. Franzese, JR, 63–92. Sage: Los Angeles et al.

[70] First name is only shown as abbreviation.

Bernauer, Thomas, Tobias Böhmelt, and Vally Koubi. 2013a. National ENGOs registered in a country from Thomas, Bernauer, Tobias Böhmelt, and, Vally Koubi. 2013- The democracy – civil society paradox in global environmental governance. *Global Environmental Politics* 13(1):888-107. http://www.ib.ethz.ch/data/civilsoc.html. Accessed 7 May 2016.

Bernauer, Thomas, Tobias Böhmelt, and Vally Koubi. 2013b. Is there a democracy-civil society paradox in global governance? *Global Environmental Politics* 13(1):88–107.

Bernauer, Thomas, Anna Kalbhenn, Vally Koubi, and Gabriele Spilker. 2010. A comparison of international and domestic sources of global governance dynamics. *British Journal of Political Science* 40(3):509–538.

Bernauer, Thomas, and Vally Koubi. 2009. Effects of political institutions on air quality. *Ecological Economics* 68(5):1355–1365.

Bernauer, Thomas, Anna Kalbhenn, Vally Koubi, and Gabriele Spilker. 2013. Is there a "depth versus participation" dilemma in international cooperation? *The Review of International Organization* 8(4):477–497.

Binder, Seth, and Eric Neumayer. 2005. Environmental pressure group strength and air pollution: An empirical analysis. *Ecological Economics* 55(4):527–538.

Böhmelt, Tobias, Thomas Bernauer, and Vally Koubi. 2015. The marginal impact of ENGOs in different types of democratic systems. *European Political Science Review* 7(1):3–118.

Böhmelt, Tobias, Marit Böker, and Hugh Ward. 2016. Democratic inclusiveness, climate policy outputs, and climate policy outcomes. *Democratization* 23(7):1272–1291.

Bookmann, Bernhard. no year. Domestic political determinants of treaty ratification: The acceptance of ILO conventions by industrialised countries. Mannheim: Centre for European Economic Research (ZEW).

Bueno De Mesquita, Bruce, Alastair Smith, Randolph M. Siverson, and James D. Morrow. 2003. The logic of political survival. Cambridge, MA & London: MIT Press.

Bühlmann, Marc, Wolfgang Merkel, Lisa Müller, Heiko Giebler, and Bernhard Weβels. 2012. Demokratiebarometer: ein neues Instrument zur Messung von Demokratiequalität. *Zeitschrift für Vergleichende Politikwissenschaft* 6(S1):115–159.

Cao, Xun, and Aseem Prakash. 2010. Trade competition and domestic pollution: A panel study, 1980-2003. *International Organization* 64:481–503.

Castles, Francis G. 1993. Families of nations: Patterns of public policy in western democracies. Aldesrhoot et al.: Dartmouth Publisihing Company.

Chang, Shu-Chen. 2015. The effects of trade liberalization on environmental degradation. *Quality & Quantity* 49(1):235–253.

Cheibub, José Antonio, Jennifer Gandhi, and James Raymond Vreeland. 2009. Democracy and dictatorship revisited dataset 2009 (v.1). https://sites.google.com/site/joseantoniocheibub/¬datasets/democracy-and-dictatorship-revisited. Assessed 1 Aug 2017.

Cheibub, José Antonio, Jennifer Gandhi, and James Raymond Vreeland. 2010. Democracy and dictatorship revisited. *Public Choice* 143(1-2):67–101.

Christoff, Peter, and Robyn Eckersley. 2011. Comparing state responses. In *Oxford Handbook of Climate Change and Society*, eds. John S. Dryzek, Richard B. Norgaard, and David Schlosberg, 431–448. Oxford et al.: Oxford University Press.

Connelly, James, and Graham Smith. 1999. Politics and the environment. From theory to practice. London & New York: Routledge.

Coppedge, M., J. Gerring, S. Lindberg, S. Skaaning, S., Jan Teorell, David Altman, et al. 2017a. VDem[country-year/country-date] Dataset v7.1. Varieties of Democracy (V-Dem) Project. https://www.v-dem.net/en/data/data-version-7-1. Accessed 28 Nov 2018.

Coppedge, Michael, John Gerring, Staffan I. Lindberg, Svend-Erik Skaaning, Jan Teorell, et al. 2017b. V-Dem codebook v7.1. Varieties of Democracy (V-Dem) Project. https://www.v-dem.net/en/data/data-version-7-1. Accessed 28 Nov 2018.

Coppedge, Michael, Staffan I. Lindberg, Svend-Erik Skaaning, and Jan Teorell. 2016. Measuring high level democratic principles using the V-Dem data. *International Political Science Review* 37(5):580–593.

Crepaz, Markus M.L. 1995. Explaining national variations of air pollution levels: Political institutions and their impact on environmental policy-making. *Environmental Politics* 4(3):391–414.

Crowley, Kate. 2007. Is Australia faking it? The Kyoto Protocol and the greenhouse policy challenge. *Global Environmental Politics* 7(4):118–139.

Cruz, Cesi, Philip Keefer, and Carlos Scartascini. 2016a. Database of political institutions dataset, 2015 update (DPI2015). Updated version of Beck, Thorsten, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh. 2001. New tools in comparative political economy: The database of political institutions. *World Bank Economic Review* 15(1):165-176. Washington, D.C.: Inter-American Development Bank. http://www.iadb.org/en/research-and-data/publication-details,3169.html?pub_id=IDB-DB-121. Accessed 18 May 2016.

Cruz, Cesi, Philip Keefer, and Carlos Scartascini. 2016b. Database of political institutions 2015: Codebook. Washington, D.C.: Inter-American Development Bank (IDB). http://www.iadb.org/en/research-and-data/publication-details,3169.html?pub_id=IDB-DB-121. Accessed 18 May 2016.

Dauvergne, Peter. 2017. The political economy of the global environment. In *Global political economy*. 5th edition, ed. John Revenhill, 387–414. Oxford: Oxford University Press.

Dean, Judith M. 2002. Does trade liberalization harm the environment? A new test. *Canadian Journal of Economics* 35(4):819–842.

De Soysa, Indra, and Eric Neumayer. 2005. False prophet, or genuine savior? Assessing the effects of economic openness on sustainable development, 1980–99. *International Organization* 59(3):731–772.

Dobbin, Frank, Beth A. Simmons, and Geoffrey Garrett. 2007. The global diffusion of public policies: Social construction, coercion, competition, or learning? *Annual Review of Sociology* 33(1):449–472.

Dolšak, Nives. 2001. Mitigating global climate change: Why are some countries more committed than others? *Policy Studies Journal* 29(3):414–436.

Dolšak, Nives. 2009. Climate change policy implementation: A cross-sectional analysis. *Review of Policy Research* 26(5):551–570.

Donchev, Dilyan, and Gergely Ujhelyi. 2014. What do corruption indices measure? *Economics & Politics* 26(2):309–331.
Downs, George W., David M. Rocke, and Peter N. Barsoom. 1996. Is the good news about compliance good news about cooperation? *International Organization* 50(3):379–406.
Dreher, Axel. 2006. Does globalization affect growth? Evidence from a new index of globalization. *Applied Economics* 38(10):1091–1110.
Escher, Romy, and Melanie Walter-Rogg. 2020. Environmental Performance in Democracies and Autocracies. Democratic Qualities and Environmental Protection. Cham: Palgrave Macmillan.
Escher, Romy, and Melanie Walter-Rogg. 2018. Does the conceptualization and measurement of democracy quality matter in comparative climate policy research? *Politics and Governance* 6(1):117–144.
Esty, Daniel C. 2011. Economic integration and environmental protection. In *The global environment. Institutions, law, and policy.* Third Edition, eds. Regina S. Axelrod, Stacy D. VanDeveer, and David Leonard Downie, 155-171. Washington: CQ Press.
Fiorino, Daniel J. 2011. Explaining national environmental performance: approaches, evidence, and implications. *Policy Sciences* 44(4):367–389.
Franzese, Robert J., JR., and Jude C. Hays. 2007. Spatial econometric models of cross-sectional interdependence in political science panel and time-series-cross-section data. *Political Analysis* 15:140–164.
Fredriksson, Per G., and Daniel L. Millimet. 2007. Legislative organization and pollution taxation. *Public Choice* 131(1-2):217–242.
Fredriksson, Per G., Eric Neumayer, and Gergely Ujhelyi. 2007. Kyoto Protocol cooperation: Does government corruption facilitate environmental lobbying? *Public Choice* 133(1-2):231–251.
Fredriksson, Per G., and Gergely Ujhelyi, Gergely. 2006. Political institutions, interest groups, and the ratification of international environmental agreements. https://www.researchgate.net/profile/Per_Fredriksson/publication/240180711_POLITICAL_INSTITUTIONS_INTEREST_GROUPS_AND_THE_RATIFICATION_OF_INTERNATIONAL_ENVIRONMENTAL_AGREEMENTS/links/54af03b50cf2b48e8ed4f612.pdf. Accessed 13 Nov 2019.
Fredriksson, Per G., and Jim R. Wollscheid. 2007. Democratic institutions versus autocratic regimes: The case of environmental policy. *Public Choice* 130(3-4):381–393.
Freedom House. 2015. Freedom of the world. http://www.freedomhouse.org/report/freedom-world-aggregate-and-subcategory-scores. In *Quality of Government Standard Dataset, version Jan16*, eds. Jan Teorell, Stefan Dahlberg, Sören Holmberg, Bo Rothstein, Anna Khomenko, and Jakob Svensson. Göteburg: The University of Gothenburg: The Quality of Government Institute. http://qog.pol.gu.se/data/datadownloads/qogstandarddata. Accessed 1 Jan 2016.
Galeotti, Marzio, Alessandro Lanza, and Francesco Pauli. 2006. Reassessing the environmental Kuznets curve for CO_2 emissions: A robustness exercise. *Ecological Economics* 57(1):152–163.
Gallagher, Kevin P. 2009. Economic globalization and the environment. *Annual Review of Environment and Resources* 34(1):279–304.
Gallego-Alvarez, Isabel, Mª Vicente-Galindo, Mª Galindo-Villardón, and Miguel Rodríguez-Rosa. 2014. Environmental performance in countries worldwide: Determinant factors and multivariate analysis. *Sustainability* 6(11):7807–7832.
Gandhi, Jennifer, and Adam Przeworski. 2007. Authoritarian institutions and the survival of autocrats. *Comparative Political Studies* 40(11):1279–1301.
Ganghof, Steffen. 2003. Promises and pitfalls of veto player analysis. *Swiss Political Science Review* 9(2):1–25.
Garmann, Sebastian. 2014. Do government ideology and fragmentation matter for reducing CO_2-emissions? Empirical evidence from OECD countries. *Ecological Economics* 105, 1–10.
Garrett, Geoffrey, and Deborah Mitchell. 2001. Globalization, government spending and taxation in the OECD. *European Journal of Political Research* 39:145–177.
Gilardi, Fabrizio. 2013. Transnational diffusion: Norms, ideas, and policies. In *Handbook of international relations*, eds. Walter Carlsnaes, Thomas Risse, and Beth A. Simmons, 453–477. Los Angeles et al.: Sage.
Gupta, Joyeeta. 2010. A history of international climate change policy. *Wiley Interdisciplinary Reviews: Climate Change* 1(5):636–653.
Gygli, Savina, Florian Haelg, Niklas Potrafke, and Jan-Egbert Sturm. 2019. The KOF Globalisation Index - revisited. *The Review of International Organizations* 14:543–574.
Harrison, Kathryn, and Lisa McIntosh Sundstrom. 2010a. Introduction: Global commons, domestic decisions. In *Global commons, domestic decisions. The comparative politics of climate change*, eds. Kathryn Harrison, and Lisa McIntosh Sundstrom, 1-22. Cambridge & London: The MIT Press.
Harrison, Kathryn, and Lisa McIntosh Sundstrom. 2010b. Conclusion: The comparative politics of climate change. In *Global commons, domestic decisions. The comparative politics of climate change*, eds. Kathryn Harrison, and Lisa McIntosh Sundstrom, 261–290. Cambridge & London: The MIT Press.
Hathaway, Oona A. 2007. Why do countries commit to human rights treaties? *Journal of Conflict Resolution* 51(4):588–621.
Hathaway, Oona A. 2008. Treaties' end: The past, present, and future of international lawmaking in the United States. *Yale Law Journal* 117:1236–1372.
Heggelund, Gorild, Steinar Andresen, and Inga Fritzen Bua. 2010. Chinese climate policy: Domestic priorities, foreign policy, and emerging implementation. In *Global commons, domestic decisions. The comparative politics of climate change*, eds. Kathryn Harrison, and Lisa McIntosh Sundstrom, 229–259. Cambridge & London: The MIT Press.
Henisz, Witold J. 2000. The institutional environment for economic growth. *Economics & Politics* 12(1):1–31.
Henisz, Witold J. 2002. The institutional environment for infrastructure investment. *Industrial and Corporate Change* 11(2):355–389.
Holzinger, Katharina, Christoph Knill, and Thomas Sommerer. 2008. Environmental policy convergence: The impact of international harmonization, transnational communication, and regulatory competition. *International Organization* 62:553–587.

IASA (International Institute for Applied Systems Analysis) 2004. 13 IIASA-POP World regions, definition. http://webarchive.iiasa.ac.at/Research/POP/proj01/countries.html. Accessed 10 Sep 2016.

Jahn, Detlef. 1998. Environmental performance and policy regimes: Explaining variations in 18 OECD-countries. *Policy Sciences* 31(2):107–131.

Jahn, Detlef. 2006. Globalization as 'Galton's problem': The missing Link in the Analysis of diffusion patterns in welfare state development. *International Organization* 60(2):401–431.

Jahn, Detlef. 2008. The politics of climate change. Paper prepared for delivery at the 2008 Joint Sessions of Workshops Friday 11th-Wednesday 16th April 2008 in Rennes (France) in the Workshop "The Politics of Climate Change" organized by Hugh Compston (Cardiff University). https://ecpr.eu/Filestore/PaperProposal/b230ae79-4191-48be-93d3-631a05c7b90f.pdf. Accessed 13 Nov 2019.

Jahn, Detlef. 2009. Globalisierung als Galton-Problem: Regionale und temporale Diffusionsschübe. In *Methoden der Vergleichenden Politik- und Sozialwissenschaft. Neuere Entwicklungen und Anwendungen*, eds. Susanne Pickel, Gert Pickel, Hans-Joachim Lauth, and Detlef Jahn, 87–112. Wiesbaden: VS Verlag für Sozialwissenschaften.

Jahn, Detlef. 2010. The veto player approach in macro-comparative politics: Concepts and Measuruement. In *Reform Processes and Policy Change*, eds. Thomas König, Marc Debus, and George Tsebelis, 43–68. New York, NY: Springer.

Jahn, Detlef. 2013a. Einführung in die vergleichende Politikwissenschaft. 2. Auflage. Wiesbaden: Springer VS.

Jahn, Detlef. 2013b. The impact of climate on atmospheric emissions: Constructing an index of heating degrees for 21 OECD countries from 1960 to 2005. *Weather, Climate, and Society* 5(2):97–111.

Jahn, Detlef. 2013c. "Temperature per capita": Measuring annual heating and cooling degrees in 21 OECD Countries from 1960 to 2005. Greifswald: Comparative Politics. Department of Political Science and Communication Studies. University of Greifswald. (Greifswald Comparative Politics Working Paper 6).

Jahn, Detlef. 2015. Diffusion. In *Handbuch Policy-Forschung*, eds. Georg Wenzelburger, and Reimut Zohlnhöfer, 247–276. Wiesbaden: Springer VS.

Jahn, Detlef. 2016a. The politics of environmental performance. Institutions and preferences in industrialized democracies. Cambridge: Cambridge University Press.

Jahn, Detlef. 2016b. Globalisierung und Vergleich. In *Handbuch Vergleichende Politikwissenschaft*, eds. Hans-Joachim Lauth, Marianne Kneuer, and Gert Pickel 861–870. Wiesbaden: Springer VS.

Jahn, Detlef. 2016c. Umwelt in der Vergleichenden Politikwissenschaft. In *Handbuch Vergleichende Politikwissenschaft*, eds. Hans-Joachim Lauth, Marianne Kneuer, and Gert Pickel, 677–688. Wiesbaden: Springer VS.

Jahn, Detlef, and Sebastian Stephan. 2015. The problem of interdependence. In *Comparative Politics. Theoretical and Methodological Challenges*, eds. Dietmar Braun, and Martino Maggetti, 14–54. Cheltenham & Northhamption, MA: Edgar Elgar Publishing.

Jahn, Detlef, and Sonja Wälti. 2007. Umweltpolitik und Föderalismus: Zur Klärung eines ambivalenten Zusammenhangs. In *Politik und Umwelt* (Politische Vierteljahresschrift Sonderheft 39/2007), eds. Klaus Jacob, Frank Biermann, Per-Olof Busch, and Peter H. Feindt, 262–279. Wiesbaden: VS Verlag für Sozialwissenschaften.

Jensen, Christian B., and Jae-Jae Spoon. 2011. Testing the 'party matters' thesis: Explaining progress towards Kyoto Protocol targets. *Political Studies* 59(1):99–115.

Kaufmann, Daniel, Aart Kraay, and Massimo Mastruzi. 2010. The Worldwide governance indicators. methodology and analytical issues. Washington, D.C.: The World Bank Development Research Group Macroeconomics and Growth Team (Policy Research Working Paper 5430).

Knack, Stephen. 2006. Measuring corruption in Eastern Europe and Central Asia. A critique of the cross-country indicators. Washington, D.C.: World Bank (World Bank Policy Research Working Paper 3968).

Landman, Todd. 2008. Issues and methods in comparative politics: An introduction. London & New York: Routledge.

Lauth, Hans-Joachim, and Oliver Kauff. 2012. Demokratiemessung: Der KID als aggregiertes Maß für die komparative Forschung. Empirische Befunde der Regimeentwicklung von 1996 bis 2010. Würzburg: Julius-Maximillians-Universität Würzburg. (Würzburger Arbeitspapiere zur Politikwissenschaft und Sozialforschung 2).

Lauth, Hans-Joachim, Gert Pickel, and Susanne Pickel. 2009. Methoden der vergleichenden Politikwissenschaft. Eine Einführung. Wiesbaden: VS Verlag für Sozialwissenschaften.

Lenschow, Andrea, and Carina Sprungk. 2010. The myth of a green Europe. *JCMS: Journal of Common Market Studies* 48(1):133–154.

Li, Quan, and Rafael Reuveny. 2006. Democracy and environmental degradation. *International Studies Quarterly* 50(4):935–956.

Liddle, Brantley. 2015. What are the carbon emissions elasticities for income and population? Bridging STIRPAT and EKC via robust heterogeneous panel estimates. *Global Environmental Change* 31:62–73.

Lührmann, Anna, Kyle L. Marquardt, and Valeriya Mechkova 2017. Constraining governments: New indices of vertical, horizontal and diagonal accountability. Göteburg University of Gothenburg. The Varieties of Democracy Institute & Department of Political Science. (Working Paper 46).

Lynch, Diahanna. 2000. Closing the deception gap: Accession to the European Union and environmental standards in East Central Europe. *The Journal of Environment & Development* 9(4):426–437.

Makido, Yasuyo, Shobhakar Dhakal, and Yoshiki Yamagata. 2012. Relationship between urban form and CO_2 emissions: Evidence from fifty Japanese cities. *Urban Climate* 2, 55–67.

Marshall, Monty G., Ted Robert Gurr, and Keith Jaggers. 2015. Polity IV Project. Political regime characteristics and transitions, 1800-2015. Dataset users' manual. center for systemic peace (Polity IV dataset version 2015). http://www.systemicpeace.org/inscrdata.html. Accessed 6 Jul 2016.

Martens, Pim, and Daniel Zywitz. 2006. A modified globalization index. *Journal of International Development* 18:331–350.

Matthews, Mary M. 2001. Institutions, interests, energy, and the environment: Policymaking in corporatism, pluralism, and beyond. *Policy Studies Journal* 29(3):407–413.

Mattes, Michaela, and Mariana Rodríguez. 2014. Autocracies and international cooperation. *International Studies Quarterly* 58(3):527–538.

McCormick, John. 2001. Comparative politics in transition. Third Edition. Singapore et al.: Wadsworth & Thomas Learning.
McGuire, Martin C., and Mancur Olson. 1996. The economics of autocracy and majority rule: The invisible hand and the use of force, 38–73.
McMann, Kelly, Daniel Pemstein, Brigitte Seim, Jan Teorell, and Staffan I. Lindberg. 2016. Strategies of validation: Assessing the varieties of democracy corruption Data. Gothenburg: University of Gothenburg. The Varieties of Democracy Institute & Department of Political Science. (Working Paper 23).
Merkel, Wolfgang. 2004. Embedded and defective democracies. *Democratization* 11(5):33–58.
Merkel, Wolfgang. 2016. Eingebettete und defekte Demokratien. In *Zeitgenösische Demokratietheorie. Band 2: Empirische Demokratietheorien*, eds. Oliver W. Lembcke, Claudia Ritzi, and Gary S. Schaal, 455–484. Wiesbaden: Springer VS.
Milesi-Ferretti, Gian Maria, Roberto Perotti, and Massimo Rastagno. 2002. Electoral systems and public spending. *The Quarterly Journal of Economics*, 609–657.
Milner, Helen V., and Robert O. Keohane. 1996. Internationalization and domestic politics: An introduction. In *Internationalization and Domestic Politics*, eds. Robert O. Keohane, and Helen V. Milner, 3–24. Cambridge et al.: Cambridge University Press.
Müller, Thomas, and Susanne Pickel. 2007. Wie lässt sich Demokratie am besten messen? Zur Konzeptqualität von Demokratie-Indizes. *Politische Vierteljahresschrift* 48(3): 511–539.
Munck, Gerardo L., and Jay Verkuilen. 2002. Conceptualizing and measuring democracy. *Comparative Political Studies* 35(1):5–34.
Neumayer, Eric. 2002a. Do democracies exhibit stronger international environmental commitment? A cross-country analysis. *Journal of Peace Research* 39(2):139–164.
Neumayer, Eric. 2002b. Can natural factors explain any cross-country differences in carbon dioxide emissions? *Energy Policy* 30:7–12.
Neumayer, Eric. 2003. Are left-wing party strength and corporatism good for the environment? Evidence from panel analysis of air pollution in OECD countries. *Ecological Economics* 45(2):203–220.
Neumayer, Eric, and Thomas Plümper. 2010. Making spatial analysis operational: Commands for generating spatial-effect variables in monadic and dyadic data. *The Stata Journal* 10(4):585–605.
Neumayer, Eric, and Thomas Plümper. 2012. Conditional spatial policy dependence. *Comparative Political Studies* 45(7):819–849.
O'Donnell, Guillermo. 1998. Horizontal accountability in new democracies. *Journal of Democracy* 9(3):112–126.
Obinger, Herbert. 2000. Politisches Regime, politische Stabilität und Wirtschaftswachstum. *Swiss Political Science Review* 6(2), 1–26.
Obinger, Herbert. 2004. Politik und Wirtschaftswachstum. Wiesbaden: VS Verlag für Sozialwissenschaften.
Pellegrini, Lorenzo. 2011. Corruption, development and the environment. Dordrecht: Springer Netherlands.
Pellegrini, Lorenzo, and Reyer Gerlagh. 2006. Corruption, democracy, and environmental policy. *The Journal of Environment & Development* 15(3):332–354.
Pemstein, Daniel., Kyle L. Marquardt, Eitan Tzelgov, Yi-ting Wang, Joshua Krusell, and Farhard Miri. 2017. V-Dem measurement model: Latent variable analysis for cross-national and cross-temporal expert-coded data. Göteburg: Varieties of Democracy Institute. (Working Paper 21, 2nd ed.).
Pennings, Paul, Hans Keman, and Jan Kleinnijenhuis. 2006. Doing research in political science. Second edition. London et al.: Sage Publications.
Persson, Torsten, Gerard Roland, and Guido Tabellini. 2007. Electoral rules and government spending in parliamentary democracies. *Quarterly Journal of Political Science* 2(2):155–188.
Persson, Torsten, and Guido Tabellini. 1999. The size and scope of government: Comparative politics with rational politicians. *European Economic Review* 43:699–735.
Pevehouse, Jon C., and Timothy Nordstrom. 2003. Codebook for correlates of war 2. International governmental organizations data set. Version 2.1. http://www.correlatesofwar.org/data-sets/IGOs. Accessed 7 May 2016.
Pevehouse, Jon C., Timothy Nordstrom, and Kevin Warnke. 2010. The COW-2 international organizations dataset version 2.3. Conflict management and peace science (21), S. 101-119. http://www.correlatesofwar.org/data-sets/IGOs. Accessed 7 May 2016.
Pickel, Susanne, Toralf Stark, and Wiebke Breustedt. 2015. Assessing the quality of quality measures of democracy: a theoretical framework and its empirical application. *European Political Science* 14(4):496–520.
Poloni-Staudinger, Lori M. 2008. Are consensus democracies more environmentally effective? *Environmental Politics* 17(3):410–430.
Povitkina, Marina. 2018. The limits of democracy in tackling climate change. *Environmental Politics* 27(3):411–432.
Prakash, Aseem, and Matthew Potoski. 2007. Investing up: FDI and the cross-country diffusion of ISO 14001 management systems. *International Studies Quarterly* 51(3):723–744.
Raustiala, Kal. 1997. States, NGOs, and international environmental institutions. *International Studies Quarterly* 41(4):719–740.
Roberts, J. Timmons, Bradley C. Parks, and Alexis A. Vásquez. 2004. Who ratifies environmental treaties and why? Institutionalism, structuralism and participation by 192 nations in 22 treaties. *Global Environmental Politics* 4(3):22–64.
Roller, Edeltraud. 2005. The performance of democracies. Political institutions and public policies. Oxford: Oxford University Press.
Rothstein, Bo, and Jan Teorell. 2008. What is quality of government? A theory of impartial government institutions. *Governance: An Internaitonal Journal of Policy, Administration, and Institutions* 21(2):165–190.
Ruoff, Gabriele. 2009. Grow rich and clean up later? Joint effects of IGO membership and democracy on environmental performance in developing countries. National Centre of Competence in Research (NCCR) (Challenges to Democracy in the 21st Century Working Paper 33).
Russett, Bruce, and John R. Oneal. 2001. Triangulating peace: Democracy, interdependence, and international organizations. New York: Norton.

Schirm, Stefan A. 2007. Analytical overview: state of the art of research on globalization. In *Globalization: State of the art and perspectives*, ed. Stefan A. Schirm, 1–21. London & New York: Routledge.
Schmidt, Manfred G. 1996. When parties matter: A review of the possibilities and limits of partisan influence on public policy. *European Journal of Political Research* 30:155–183.
Schreurs, Miranda A., and Yves Tiberghien. 2007. Multi-level reinforcement: Explaining European Union leadership in climate change mitigation. *Government and Opposition* 7(4):19–46.
Schreurs, Miranda A., and Yves Tiberghien. 2010. European Union leadership in climate change: Mitigation through multilevel reinforcement. In *Global Commons, Domestic Decisions. The Comparative Politics of Climate Change*, eds. Kathryn Harrison, and Lisa McIntosh Sundstrom, 23–66. Cambridge & London: The MIT Press.
Schulze, Kai. 2014. Do parties matter for international environmental cooperation? An analysis of environmental treaty participation by advanced industrialised democracies. *Environmental Politics* 23(1):115–139.
Scruggs, Lyle A. 1999. Institutions and environmental performance in seventeen western democracies. *British Journal of Political Science* 29(1):1–31.
Scruggs, Lyle. 2001. Is there really a link between neo-corporatism and environmental performance? Updated evidence and new data for the 1980s and 1990s. *British Journal of Political Science* 31(4):686–692.
Scruggs, Lyle. 2003. Sustaining abundance: Environmental performance in industrial democracies. Cambridge: Cambridge University Press.
Siaroff, Alan. 1999. Corporatism in 24 industrial democracies: Meaning and measurement. *European Journal of Political Research* 36:175–205.
Simmons, Beth A. 2009. Mobilizing for human rights. International law in domestic politics. Appendix 3.2 ratification rules. Cambridge et al.: Cambridge University Press. http://scholar.harvard.edu/bsimmons/mobilizing-for-human-rights. Accessed 7 Sep 2016.
Spilker, Gabriele. 2012. Helpful organizations: Membership in inter-governmental organizations and environmental quality in developing countries. *British Journal of Political Science* 42(2):345–370.
Spilker, Gabriele. 2013. Globalization, political institutions and the environment in developing countries. New York, London: Routledge.
Sprinz, Detlef, and Tapani Vaahtoranta. 1994. The interest-based explanation of international environmental policy. *International Organization* 48(1):77–105.
Stern, David I. 2004. The rise and fall of the environmental Kuznets curve. *World Development* 32(8):1419–1439.
Strøm, Kaare, and Stephen M. Swindle. 1993. Political parties, institutions and environmental reform. Berkeley: Center for German and European Studies. University of California. (Working Paper 2.17).
Swank, Duane. 2013. Comparative political parties dataset: Electoral, legislative, and government strength of political parties by ideological group in 21 capitalist democracies, 1950-2011. Electronic database, department of political science, Marquette University. http://www.marquette.edu/polisci/faculty_swank.shtml. Accessed 1 Aug 2016.
The World Bank Group. 2016a. Trade (% of GDP). http://data.worldbank.org/indicator/NE.TRD.GNFS.ZS. Accessed 7 May 2016.
The World Bank Group. 2016b. GDP per capita, PPP (constant 2011 international $). http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.KD. Accessed 06 Aug 2016.
The World Bank Group. 2016c. Fuel exports (% of merchandise exports). https://data.worldbank.org/indicator/TX.VAL.FUEL.ZS.UN. Accessed 17 Nov 2016.
The World Bank Group. 2016d. Industry (including construction), value added (% of GDP). https://data.worldbank.org/indicator/NV.IND.TOTL.ZS. Accessed 17 Nov 2016.
The World Bank Group. 2016e. Urban population (% of total). https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS. Accessed 17 Nov 2016.
The World Bank Group. 2017a. GDP growth (annual %). http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG. Accessed 15 Jun 2017.
The World Bank Group 2017b. Population density (people per sq. km of land area). https://data.worldbank.org/indicator/EN.POP.DNST. Accessed 1 Jun 2017.
The World Bank Group. 2017c. Population growth (annual %). https://data.worldbank.org/indicator/sp.pop.grow. Accessed 1 Jun 2017.
The World Bank Group. no year. World Bank country and lending groups. https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups. Accessed 4 Mar 2019.
Timmons, David, Nikolaos Zirogiannis, and Manuel Lutz. 2016. Location matters: Population density and carbon emissions from residential building energy use in the United States. *Energy Research & Social Science* 22:37–146.
Torras, Mariano, and James K. Boyce. 1998. Income, inequality, and pollution: a reassessment of the environmental Kuznets Curve. *Ecological Economics* 25:147–160.
Tosun, Jale. 2012. Environmental monitoring and enforcement in Europe: A review of empirical research. *Environmental Policy and Governance* 22(6):437–448.
Tosun, Jale. 2015. Umweltpolitik. In *Handbuch Policy-Forschung*, eds. Georg Wenzelburger, and Reimut Zohlnhöfer, 641–662. Wiesbaden: Springer Fachmedien Wiesbaden.
Transparency International. 2016a. Corruption perceptions index 2016: Technical methodological note. https://www.transparency.org/news/feature/corruption_perceptions_index_2016. Accessed 9 Jul 2017.
Transparency International. 2016b. Corruption perceptions index 2016: Frequently asked questions. Accessed in https://www.transparency.org/news/feature/corruption_perceptions_index_2016, 09.07.2017.
Treisman, Daniel. 2000. The causes of corruption: a cross-national study. *Journal of Public Economics* 76(3):399–457.
Treisman, Daniel. 2007. What we learned about the causes of corruption from ten years of cross-national empirical research? *American Review of Political Science* 10:211–244.
Tsebelis, George. 1995. Decision making in political systems: Veto players in presidentialism, parliamentarism, multicameralism and multipartyism. *British Journal of Political Science* 25(3):289–325.

Tsebelis, George. 2002. Veto players. How political institutions work. New York & Princeton (NJ): Rusell Sage Foundation & Princeton University Press.

Tsebelis, George. 2010. Veto player theory and policy change: An introduction. In *Reform Processes and Policy Change*, eds. Thomas König, Marc Debus, and George Tsebelis. New York, NY: Springer: 3–18.

Tubi, Amit, Itay Fischhendler, and Eran Feitelson. 2012. The effect of vulnerability on climate change mitigation policies. *Global Environmental Change* 22(2):472–482.

United Nations [UN] Comtrade. 2017. UN comtrade database. https://comtrade.un.org/. Accessed 18 Feb 2017.

UNFCCC. 2016. Parties & Observers. https://unfccc.int/parties-observers. Accessed 18 Feb 2017.

United Nations Conference on Trade and Development. UNCTAT. 2015. Foreign direct investment: Inward and outward flows and stock, annual, 1980-2014 (World Investment Report 2015: Reforming international investment Governance). http://unctad.org/en/Pages/statistics.aspx. Accessed 5 Aug 2016.

van Alstine, James, and Eric Neumayer. 2008. The environmental Kuznets curve. In *Handbook on trade and the environment*, ed. Kevin P. Gallagher, 49–59. Cheltenham & Northhampton, MA: Edward Elgar.

von Stein, Jana. 2008. The international law and politics of climate change. Ratification of the United Nations Framework Convention and the Kyoto Protocol. *Journal of Conflict Resolution* 52(2):243–268.

von Stein, Jana. no year a. STATA code to generate dates of independence (countries that gained independence after 1960). http://www.janavonstein.org/data.html. Accessed 1 Aug 2016.

von Stein, Jana. no year b. Data from The international law and politics of climate change. http://www.janavonstein.org/data.html. Accessed 9 Aug 2016.

Ward, Hugh. 2006. International linkages and environmental sustainability: The effectiveness of the regime network. *Journal of Peace Research* 43(2):149–166.

Ward, Hugh. 2008. Liberal democracy and sustainability. *Environmental Politics* 17(3):386–409.

Ward, Hugh, Cao, Xun, and Bumba Mukherjee. 2014. State capacity and the environmental investment gap in authoritarian states. *Comparative Political Studies* 47 (3), S. 309–343.

Wenzelburger, Georg, and Frieder Neumann. 2015. Vergleichende Staatstätigkeitsforschung: Entwicklungslinien - Heidelberger Schule - integrative Erklärungsansätze. In *Einführung in die Vergleichende Politikwissenschaft. Institutionen – Akteure – Policies*, eds. Uwe Wagschal, Sebastian Jäckle, and Georg Wenzelburger, 251–264. Stuttgart: Verlag W. Kohlhammer.

Wenzelburger, Georg, and Reimut Zohlnhöfer. 2014. Institutionen und Public Policies. In *Lehrbuch der Politikfeldanalyse*. 3., aktualisierte und überarbeitete Auflage, eds. Klaus Schubert, and Nils C. Bandelow, 311–340. Munich: De Gruyter & Oldenbourg.

Wheeler, David. 2001. Racing to the bottom? Foreign investment and air pollution in developing countries. *Journal of Environment & Development* 10(3):225–245.

Wolf, Frieder. 2015. Regressionsanalyse gepoolter Zeitreihen. In *Methodologie, Methoden, Forschungsdesign*, eds. Achim Hildebrandt, Sebastian Jäckle, Frieder Wolf, and Andreas Heindl, 109–132. Wiesbaden: Springer Fachmedien Wiesbaden.

Wurster, Stefan. 2013. Comparing ecological sustainability in autocracies and democracies. *Contemporary Politics* 19(1):76–93.

Yamagata, Yoshiki, Jue Yang, and Joseph Galaskiewicz. 2013. A contingency theory of policy innovation: how different theories explain the ratification of the UNFCCC and Kyoto Protocol. *International Environmental Agreements: Politics, Law and Economics* 13(3):251–270.

Zohlnhöfer, Reimut. 2015. Globalisierung. In *Handbuch Policy-Forschung*, eds. Georg Wenzelburger, and Reimut Zohlnhöfer, 199–224. Wiesbaden: Springer VS.

Zürn, Michael. 2002. From interdependence to globalization. In *Handbook of international relations*, eds. Walter Carlsnaes, Thomas Risse, and Beth A. Simmons, 235–254. London et al.: Sage Publications.

7 Climate commitment

Abstract

This study contributes to the literature on globalisation and climate commitment by examining the possible moderation effects of domestic political institutions. To this end, it tests the hypotheses of the veto-player, political-corruption, and regime-type approaches in relation to the joint effect of international integration and domestic political institutions. The statistical analysis offers no support for the veto-player approach or the political-corruption approach. However, the findings indicate that regime-type differences do influence the relationship between political globalisation and climate commitment. In contrast to earlier research, this study also shows that treaty design matters. International political integration contributes only in autocracies to UNFCCC ratification. Non-democracies join international organisations, as well as soft international treaties such as the UNFCCC, to enhance their international reputations. By contrast, civil rights strengthen the positive effect of international political integration on Kyoto Protocol ratification. Countries that accept the rule of law at the domestic level also join more demanding international agreements. A case study of Bolivia contributes to a better understanding of the causal relationships.

Is globalisation good or bad for climate commitment and does its effect depend on domestic political institutions? The first section (7.1) of this chapter explains the application of proportional-hazards models to answer my research questions. The following section (7.2) examines univariate distributions of dependent and independent variables to ensure a better interpretation of the statistical results. To consider differences in treaty design (see Chapter 2), UNFCCC and Kyoto Protocol ratification are studied separately (Sections 7.3 and 7.4). Both sections begin by examining the effect of international integration on climate commitment; they then explore the joint effects of globalisation and domestic political institutions, based on the explanatory models developed in Chapter 5. Section 7.5 discusses the statistical results. A short case study involving Bolivia, which complements the statistical analysis, contributes to a better understanding of the causal relationships. The last section summarises the findings and conclusions.

7.1 Analysis method: Survival analysis

Previous research has used survival analyses,[71] logistic analyses, or OLS (Ordinary Least Squares) regression analyses to study the ratification of climate treaties (see Chapters 2 & 3). The present study uses a survival analysis. First, the UNFCCC and Kyoto Protocol have nearly universal membership (see Figures 7.2.1 and 7.2.2). Consequently, a logistic regression, i.e. an analysis of ratification or non-ratification of both international treaties, is not feasible (Neumayer, 2002, p. 818). The dependent variable in a survival analysis is a combination of the occurrence of an event, i.e. a country becoming a ratifier of the UNFCCC/Kyoto Protocol, and the time it takes for the event to take place (Jahn, 2013, p. 401; Wenzelburger et al., 2014, p. 161). Second, few countries have withdrawn from the UNFCCC or Kyoto Protocol (e.g., Canada from the Kyoto Protocol). Thus, the logistic-regression assumption that the probability of entering a climate agreement is the same before and after ratification does not apply (von Stein, 2008, p. 253). A survival analysis drops countries from the analysis when they have ratified the agreement. Third, in contrast to a linear regression of the duration of ratification, a survival analysis considers timing (von Stein, 2008, p. 254). Chapter 2 argues that ratification delay tells us something about climate commitment (von Stein, 2008, p. 254). Finally, a survival analysis can study countries that have not ratified the UNFCCC or the Kyoto Protocol (e.g., the United States as a non-ratifier of the Kyoto Protocol) (Jahn, 2013, pp. 401, 403; Strange, 1994, p. 246; Wenzelburger et al., 2014, pp. 169, 186). Ratification delay can also be caused by other variables, such as the number of veto players (Neumayer, 2002, pp. 818f.). This is an additional reason to consider veto points when analysing ratification behaviour.

Survival models vary with regard to the measurement of their dependent variables (Wenzelburger et al., 2014, p. 163). As the present study examines the ratification of the UNFCCC and Kyoto Protocol, i.e. dichotomous variables, a survival model based on a discrete dependent variable is applied. In this respect, discrete and continuous time models can be distinguished. The former assume that an event can only take place at certain time points, while the latter makes no such assumption (Wenzelburger et al., 2014, p. 163). As ratification is not limited to certain time points, a continuous time model is applied. A single-event model is used; it assumes that an event can take place once only for each country (Wenzelburger et al., 2014, p. 164). Country withdrawals from climate

[71] Survival analysis is also called event-history analysis (Wenzelburger et al., 2014, p. 161).

agreements rarely occur. This study also adopts the Proportional Hazards model (or Cox model, Wenzelburger et al., 2014, p. 185) a semi-parametric single-event model. While it considers the timing of events, it does not specify its functional form a priori (Wenzelburger et al., 2014, p. 164, 183f.). Thus, the time dependence of the dependent variable does not have to be specified, in contrast to parametric models (Wenzelburger et al., 2014, pp. 185f.). In contrast to non-parametric models, it is able to test the effects of independent variables on the dependent variable (Wenzelburger et al., 2014, p. 209).

In a survival analysis, censoring refers to the lack of information on the event history of cases (Wenzelburger et al., 2014, p. 166). Left-censoring, i.e. missing data at the beginning of an event history (Wenzelburger et al. 2014, p. 167) is no problem, as the research period starts with the opening of the ratification process (Fredriksson & Gaston, 2000, p. 349). Right-censoring refers to countries that have not ratified the agreement at the end of the research period (Wenzelburger et al., 2014, p. 167). This is another reason to apply a proportional-hazards model (Fredriksson & Gaston, 2000, pp. 350, 352). For the parameter estimation, it uses the so-called Partial Likelihood (PL) method, which examines the chronological order of events as a dependent variable (Wenzelburger et al., 2014, p. 187).[72] Tied events, i.e. ratifications that occurred at the same time, can be problematic for the Cox model (Wenzelburger et al., 2014, p. 186). To deal with tied events, this study applies the exact-marginal-likelihood[73] method, which offers the most exact results (Box-Steffensmeier & Jones, 2004, p. 56; Therneau & Grambsch, 2000, p. 48; Wenzelburger et al., 2014, p. 189).

The unit of analysis is country-years, given that data on the independent variables are only available on a yearly basis (see also von Stein, 2008). As most independent variables are not constant over time, the dependent variables are coded in the following way. A dichotomous variable indicates the ratification status of a country at the time when the status quo changed or at the end of the research period. A second variable measures ratification delay, counting the days between the opening of the ratification process and the ratification of the UNFCCC or Kyoto Protocol. The day of ratification is not counted. The research period starts with the opening of the ratification process (UNFCCC in 1992, Kyoto Protocol in 1998). As the EU member states negotiated and entered the Kyoto Protocol together, they are not treated as separate countries in the analysis of its ratification. Depending on the measurement level of the independent variable, the mean or modus of EU members is examined (see Table 7.2.1–7.2.3). As Chapter 6 explains, this study studies a country sample of all available countries (global comparative analysis) and a country sample of developing Non-Annex I countries. In contrast to the analysis of climate performance in developing countries, this sample includes post-communist Non-Annex I developing countries. Developed countries cannot be studied separately because of the low variance in their ratification behaviour (see Section 7.2). Analyses of the pooled sample consider Annex I status as a control variable.

7.2 Univariate analysis

Before presenting the findings, this section examines the univariate distributions of the explanatory factors as well as UNFCCC and Kyoto Protocol ratification to contribute to a better understanding of the results. Tables 7.2.1–7.2.3 summarise the measurement and coding of the independent and dependent variables.

[72] This approach is less suited to small samples (N<20) (Wenzelburger et al., 2014, p. 186).

[73] This method is also called the averaged-likelihood method (Box-Steffensmeier & Jones, 2004, p. 56)

Table 7.2.1 Measurement of climate commitment and economic and political globalisation

Variable	Measurement	Data Sources
UNFCCC ratification	Year of ratification (dichotomous variable) and ratification duration of the UNFCCC in days from June 4th, 1992 (opening day for signing) until the day of ratification. The latter is not counted.	UNFCCC (no year a)
Kyoto Protocol ratification	Year of ratification (dichotomous variable) and ratification duration of the Kyoto Protocol in days from May 16, 1998 (opening day for signing) until the day of ratification. The latter is not counted.	UNFCCC (no year b)
Economic globalisation	a. Trade openness: Logged % of the sum of imports and exports of domestic GDP corrected for population size. b. Capital openness: Logarithmised % of stock of FDI inflows of GDP. c. Policy diffusion via economic interdependence: Spatial lag variable that measures the ratification behaviour (UNFCCC/ Kyoto Protocol) of a country's five most important trading partners regarding the amount of exports and imports of commodities (connectivity indicator).	a. The World Bank Group (2016a) b. UNCTAT (2015) c. UN Comtrade (2017) & UNFCCC (no year a, b)
Political globalisation	a. IGO memberships: Annual number of full country memberships in IGOs based on data from Pevehouse et al. (2010). Missing values and no state system member are coded as no membership. b. Network centrality in IGO networks: Annual number of a country's indirect and direct IGO's ties to other countries in 1.000.	a. Pevehouse et al. (2010) b. von Stein (no year)

Notes: Analysis units = country-years. I added one to variables with an observed minimum of zero before logarithmising them.

Table 7.2.2 Measurement of veto players, political corruption, and regime type

Variable	Measurement	Data Sources
Government ideology	Left and right government ideology: 1 – in the case of a presidential system a left-wing/ right-wing chief of executive, in the case of a parliamentary system a left-wing/ right-wing largest party in parliament or if available largest seat share in government cabinet. 0 – in all other cases. Parliamentary and presidential systems are identified using information from the 'system' variable from Cruz et al. (2016). EU: Modus of each year, if no modus = 1	Developed countries: Armingeon et al. (2015); Swank (2013); developing countries: Armingeon et al. (2015); Cruz et al. (2016); Swank (2013).
Ideological heterogeneity among veto players	1 –At least one right-wing partisan veto player within domestic political institutions with veto player status in international treaty ratification. 0 – in all other cases. EU: Modus of all member states in each year, if no modus = 1.	Armingeon et al. (2015); Cruz et al. (2016), Hathaway (2008), Henisz (2002), Jahn (2010), Swank (2013)
Veto points	a. Governmental fragmentation: Logarithmised annual number of governmental parties. b. Presidential democracy: 1 – the president has veto player status in international treaty ratification. 0– in all other cases. EU: Modus of all member states in each year. c. Bicameralism: 1 – The second legislative chamber has veto player status in international treaty ratification. 0 – In all other cases. EU: Modus of all member states in each year.	a. Cruz et al. (2016) b. Simmons (2009b), Bookmann (no year) c. Hathaway (2008)
Forms of Political Corruption	a. Political corruption: Political Corruption Index b. Executive corruption: Executive Corruption Index c. Legislative corruption: Legislative corrupt activities Public sector corruption: Public Sector Coruption Index Higher values indicate higher values of political corruption.	a., b. & d. McMann et al. (2016) c. Coppedge et al. (2017) & Pemstein et al. (2017)
Regime type	a. Electoral democracy: 1 – Electoral democracy, 0 – No electoral democracy. b. Established democracy: 1 – Established democracy, 0 – No established democracy.	a. Cheibub et al. (2010, 2009) b. Freedom House (2015) & Marshall et al. (2015)
Democracy qualities	a. Vertical accountability: Vertical Accountability Index b. Horizontal accountability: Horizontal Accountability Index c. Political rights: Diagonal Accountability Index d. Civil rights: Equality before the law and individual liberty index Higher values indicate higher values of democracy quality.	Coppedge et al. (2017); Pemstein et al. (2017); Lührmann et al. (2017)

Notes: Analysis units = country-years. The variables bicameralism, presidential veto player, right veto player and government ideology variables are zero in autocratic years and autocratic years of interruption, transition and interregnum and missing in democratic years of interruption, transition and interregnum. I added one to variables with an observed minimum of zero before logarithmising them.

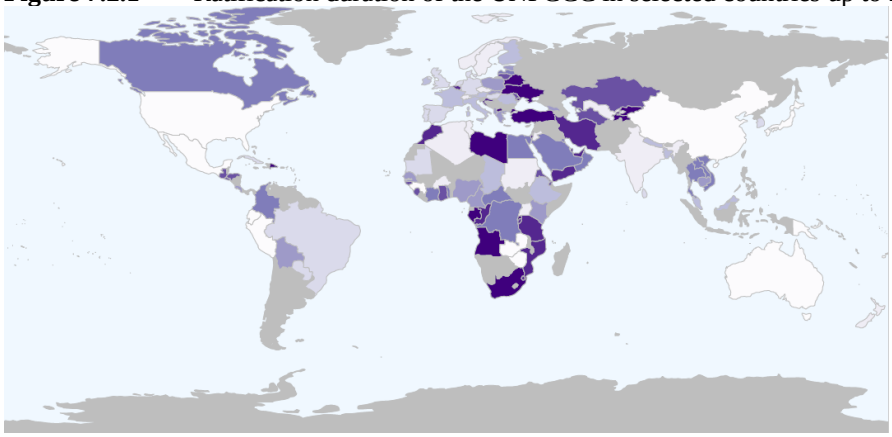
Table 7.2.3 Measurement of control variables

Variable	Measurement	Data Source
Economic Development	Natural logarithm of GDP per capita in constant 2010 US$.	The World Bank Group (2016d)
Economic growth	Annual growth rate of GDP in % at market prices based on constant local currency.	The World Bank Group (2017a)
Industry group strength	a. Logarithmised % of the industry sector of GDP. b. Logarithmised fuel exports as % of merchandise exports.	a. The World Bank Group (2016b) : b. The World Bank Group (2016c)
ENGO strength	Logarithmised number of ENGOs in a country registered with the IUCN.	Bernauer et al. (2013)
Population density	Logarithmised population size divided by land area in m².	The World Bank Group (2017b)
Climate change vulnerability	Climate change index. It indicates climate change risk exposure on a scale from 0 to 1. Higher values indicate higher climate change risk exposure.	Bättig & Bernauer (2009).
Electoral system	a. Plurality electoral system: 1 – plurality electoral system, 0 – no plurality electoral system. b. Mixed electoral system: 1 – mixed electoral system (plurality and PR), 0 – no mixed electoral system. Reference category: PR electoral system.	Cruz et al. (2016)
Types of autocracy	a. Military dictatorship: 1 – Military dictatorship, 0 – all other cases. b. Monarchy: 1 – Royal dictatorship, 0 – all other cases. Reference category: civil dictatorship	Cheibub et al. (2010, 2009)
Regional climate commitment	Regional mean of UNFCCC/ Kyoto Protocol ratification, EU = Mean of European member states.	IIASA (2004); UNFCCC (no year a, b)

Notes: Analysis units = country-years. Cross-sectional data of the climate change index refer to the period from 1990-2005. I added one to variables with an observed minimum of zero before logarithmising them.

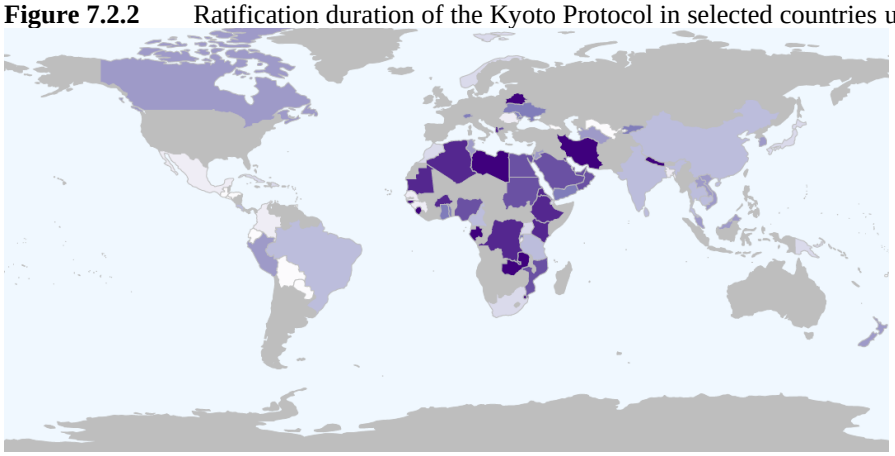
Positively skewed variables have been logarithmised. Univariate statistics of the independent variables in the analyses of UNFCCC and Kyoto Protocol ratification are presented in Tables A7.1.1 and A7.1.2 in the annex.

Figure 7.2.1 Ratification duration of the UNFCCC in selected countries up to 2006



Notes: The darker the colour the longer the duration of the ratification of the UNFCC. Missing countries are grey.

Figure 7.2.2 Ratification duration of the Kyoto Protocol in selected countries up to 2006



Notes: The darker the colour the longer the duration of the ratification of the Kyoto Protocol. Missing countries are grey.

Figures 7.2.1 and 7.2.2 present the ratification duration of countries that entered the UNFCCC and Kyoto Protocol up to the end of the research period. Annex I countries ratified the UNFCCC and Kyoto Protocol faster, on average, than Non-Annex I countries (see Table 7.2.4). Yet, there is considerable variation among Non-Annex I countries. On the one hand, there are Non-Annex I countries that ratified the Kyoto Protocol considerably faster than Annex I countries. On the other hand, some countries, especially in North and Sub-Sahara Africa, took a long time to enter into both climate treaties. There is little variation among Annex I parties in the ratification of the UNFCCC and the Kyoto Protocol. As explained above, EU member states entered the Kyoto Protocol together.

Table 7.2.4 The ratification delay of countries that ratified the UNFCCC and Kyoto Protocol during the research period: 1992 to 2006

	Mean	Std.dev.	Minimum	Maximum	N
UNFCCC					
Annex I	879	792	210	4282	33
Non-Annex I	1020	609	92	2912	84
Kyoto Protocol					
Annex I	1614	276	1099	2720	29[a]
Non-Annex I	1843	771	185	3193	76
Kyoto Protocol					
Annex I	1785	467	1099	2720	9[b]
Non-Annex	1844	771	185	3193	76

Notes: [a] EU member states as separate countries, [b] EU member states as single country. N=117. 12 countries in the dataset have not ratified the Kyoto Protocol until 2006. Std.dev. = Standard deviation.

The main independent variables – globalisation dimensions, veto points, the presence of a right-wing veto player, political-corruption dimensions, and democracy-quality dimensions – vary more between countries than over time (see Table 7.2.5). Thus, it is relevant to study whether they can help to explain country differences in climate commitment. Government ideology also changes considerably over time. Policy diffusion (UNFCCC and Kyoto Protocol ratification) differs little between countries but considerably over time. This is because, over time, most trading partners ratified the UNFCCC and Kyoto Protocol.

Trade and capital openness are not highly correlated. This justifies their separate analysis. Economic openness varies considerably among countries (see Figures 7.2.3 & 7.2.4). The figures indicate that international trade and investment does not undermine climate commitment. Despite low levels of trade and capital openness, North African and Sub-Saharan African countries took a long time to ratify the two climate treaties. The univariate distributions of the policy diffusion variables are skewed. Most countries ratified the UNFCCC fast.

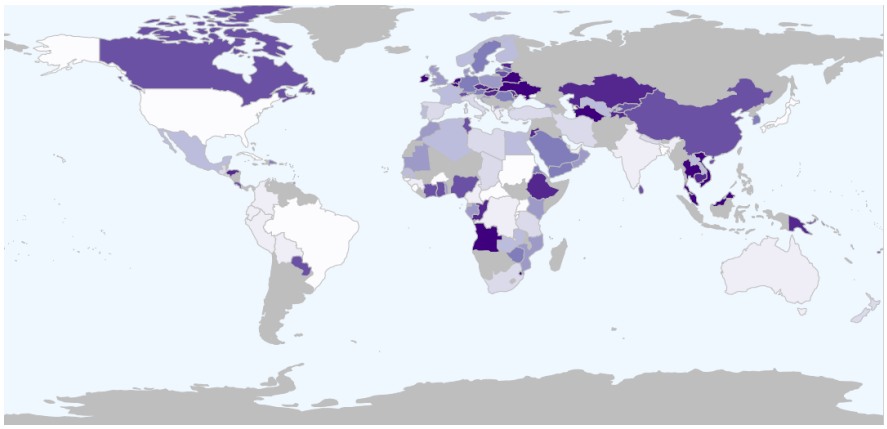
Table 7.2.5 Variation of main independent variables between and within countries (1992–2006)

	Std.dev. between	Std.dev. within	N	Countries
Trade openness (lg)	.18	.08	1749	117
Capital openness (ln)	.80	61	1751	117
Policy diffusion (UNFCCC)	.06	.24	1635	117
Policy diffusion (KP)	.05	.35	1635	117
IGO memberships	20.29	4.90	1635	117
Network Centrality	1.04	.70	1401	117
Left government	.26	.27	1715	117
Right government	.29	.28	1715	117
Centre government	.17	.19	1715	117
Right veto player (foreign)	.41	.20	1703	117
Government fragmentation	.58	.29	1747	117
Presidential veto player	.27	.12	1734	117
Bicameralism	.35	.09	1734	117
Executive corruption	.29	.06	1748	117
Legislative corruption	1.22	.26	1752	117
Public sector corruption	.30	.06	1759	117
Electoral democracy	.47	1.7	1752	117
Established democracy	.46	.19	1753	117
Vertical accountability	.78	.24	1748	117
Horizontal accountability	.97	.23	1748	117
Political rights	.89	.18	1748	117
Civil rights	.26	.06	1748	117

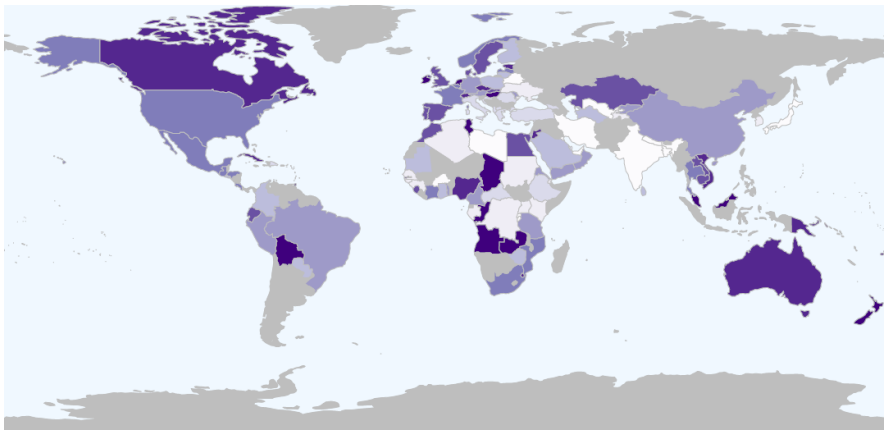
Notes: Analysis units = country-years from 1992-2006. KP = Kyoto Protocol. St.dev. = Standard deviation.

Figure 7.2.3 Country differences in international economic integration

Trade openness



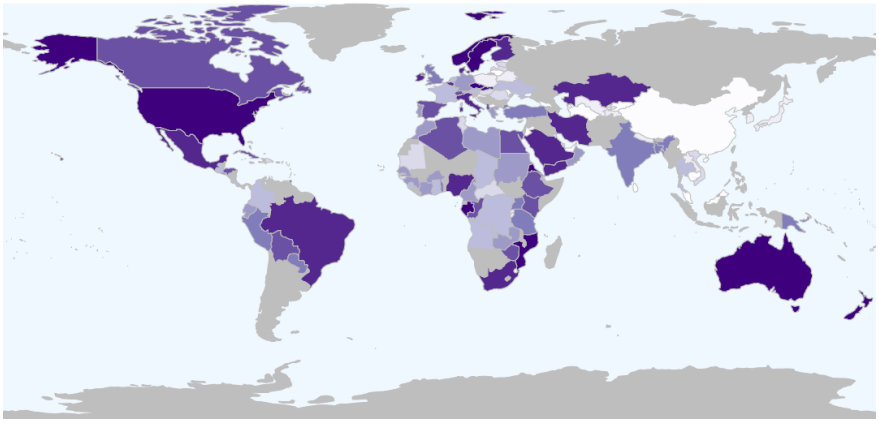
Capital openness



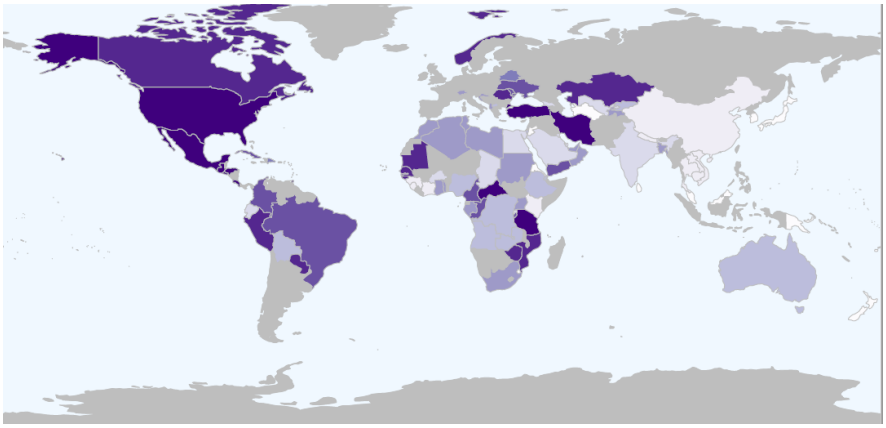
Notes: Analysis units = country averages from 1992-2006. N=117. The darker the colour the higher the level of international economic integration. Missing countries are grey.

Figure 7.2.3 Country differences in international economic integration (continuation)

Policy diffusion (UNFCCC)

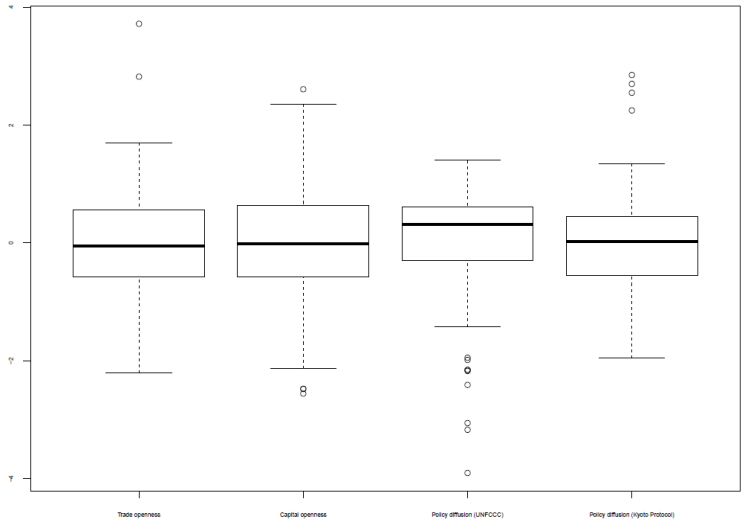


Policy diffusion (Kyoto Protocol)



Notes: Analysis units = country averages from 1992-2006. N=117. The darker the colour the higher the level of international economic integration. Missing countries are grey.

Figure 7.2.4 Variation in international economic integration

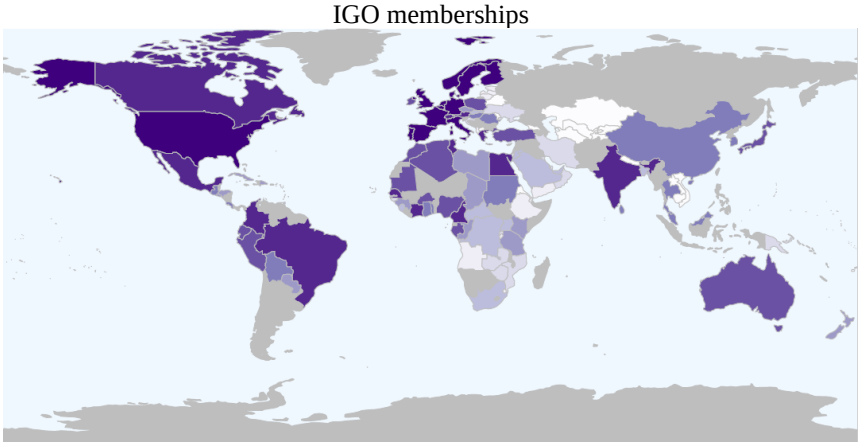


	Mean	Median	Stdev.	Minimum	Maximum
Trade openness	-.01	-.01	.18	-.40	.65
Capital openness	2.70	2.69	.80	.67	4.78
Policy diffusion (UNFCCC)	.88	.90	.06	.63	.96
Policy diffusion (Kyoto Protocol)	.39	.39	.08	.23	.63

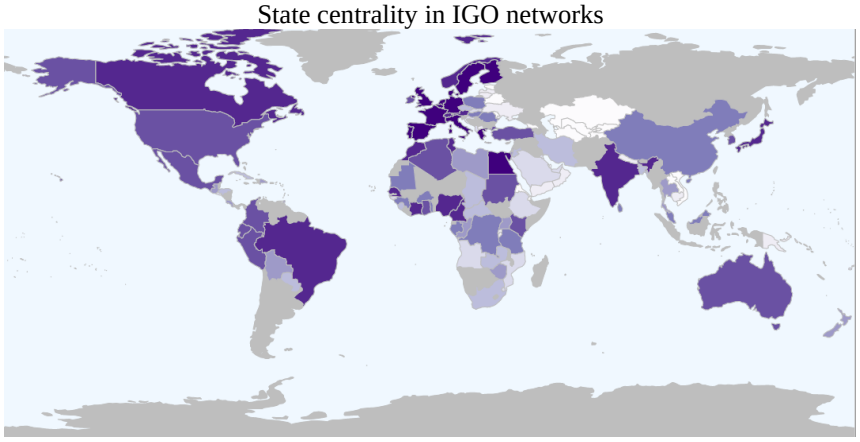
Notes: Analysis units = country averages from 1992-2006. The boxplots display z-scores. N=117.

Figure 7.2.5 Country differences in international political integration

IGO memberships

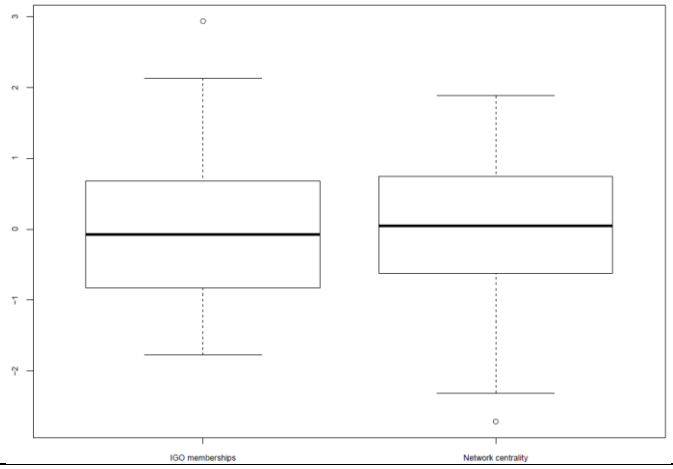


State centrality in IGO networks



Notes: Analysis units = country averages from 1992-2006. N=117. The darker the colour the higher the level of international political integration. Missing countries are grey.

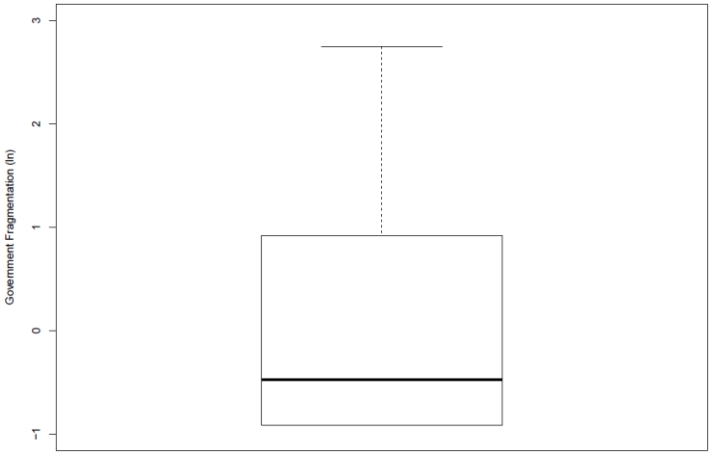
Figure 7.2.5 Country differences in international political integration (continuation)



	Mean	Median	Std.dev.	Minimum	Maximum
IGO memberships	64.92	63.43	20.29	28.93	124.43
Network centrality	5.32	5.38	1.04	2.51	7.27

Notes: Analysis units = country averages from 1992-2006. The boxplots display z-scores. N=117. Std.dev. = Standard deviation.

Figure 7.2.6 Government fragmentation



	Mean	Median	Std.dev.	Minimum	Maximum
Government fragmentation	.53	.25	.58	.00	2.12

Notes: Analysis units = country averages from 1992-2006. Government fragmentation is logarithmised. The boxplot displays z-scores. N=117. Std.dev. = Standard deviation.

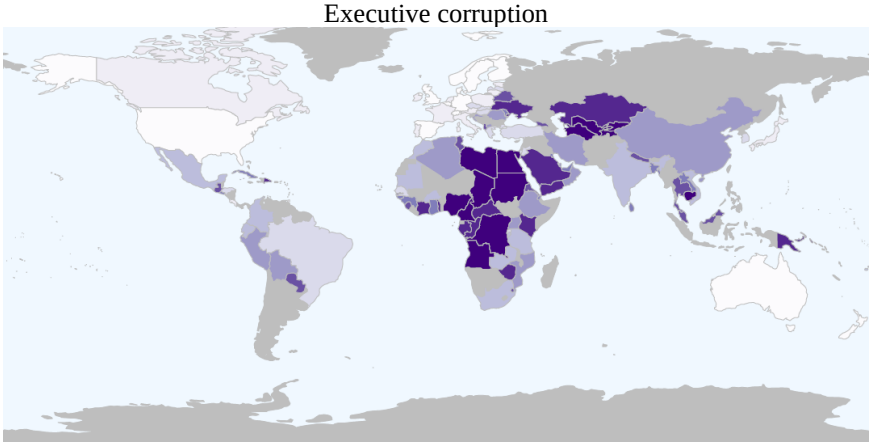
Countries also differ with regard to their international political integration, as captured by their IGO memberships and centrality in IGO networks (Figure 7.2.5). The two indicators are highly but not perfectly correlated. Both are tested in the empirical analysis. Visual inspection suggests that political globalisation contributes to UNFCCC and Kyoto Protocol ratification. Countries that were highly politically integrated ratified both climate treaties quickly (e.g., in Europe and Latin America). By contrast, Sub-Saharan African countries, which entered the UNFCCC and Kyoto Protocol relatively late, shared low levels of involvement in IGOs.

There is a lack of variation, related to indicators of government ideology, specific veto points, and the presence of a right-wing veto player, in the global comparative sample. This reflects the limited availability of data on the government ideology of partisan veto players. Data restrictions limit the explanatory power of these variables. They also cause high correlations among indicators in the veto-player approach (developing-country sample, 1992–2006: government fragmentation and bicameralism, bicameralism, and right-wing veto player, pooled sample, 1998–2006: right-wing government ideology and right-wing veto player, government fragmentation and right-wing veto player). In addition, government fragmentation is skewed. About 25% of all countries are characterised by a relatively high number of government parties (see Figure 7.2.6).

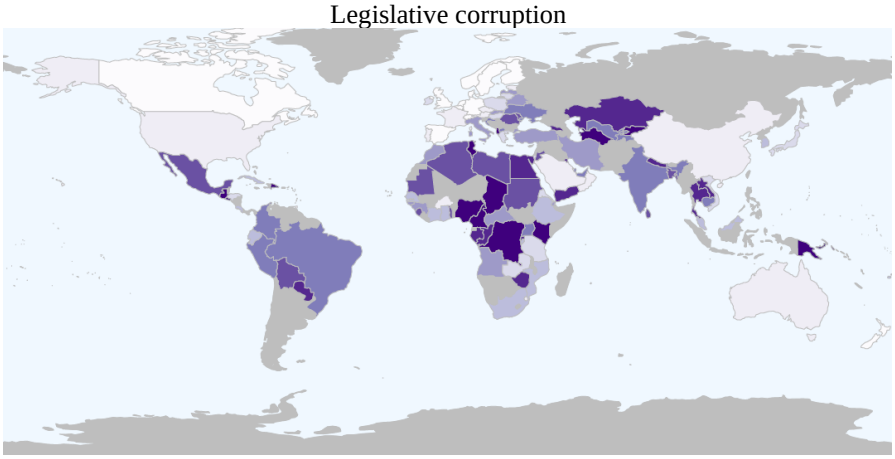
Developing countries exhibit higher values on executive and legislative corruption than developed countries (see Figure 7.2.7). In particular, governments and parliaments in Africa are highly corrupt. The two corruption dimensions are positively correlated. The box plots reveal that executive and legislative corruption varies considerably across countries. Moreover, high levels of government corruption do not necessarily imply high levels of corruption in parliament and vice versa. Latin America has severe problems with legislative corruption; it performs better with regard to executive corruption. By contrast, developed countries differ more in relation to legislative corruption, rather than executive corruption. For instance, Italy has severe problems with legislative corruption.

Figure 7.2.7 Country differences in executive and legislative corruption

Executive corruption

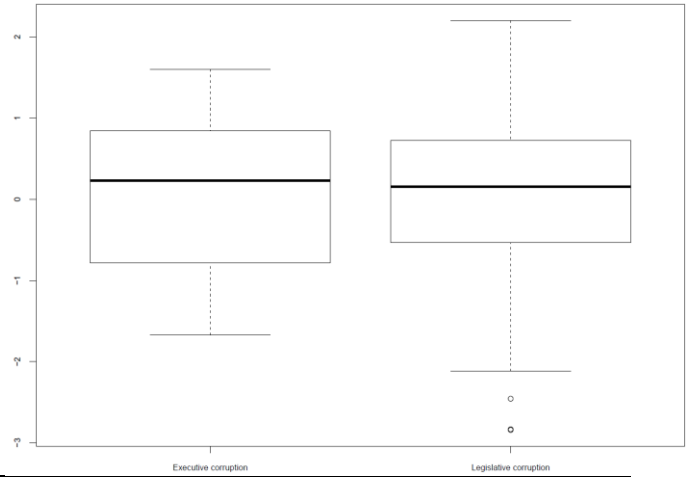


Legislative corruption



Notes: Analysis units = country averages from 1992-2006. N=117. The darker the colour the higher political corruption. Missing countries are grey.

Figure 7.2.7 Country differences in executive and legislative corruption (continuation)



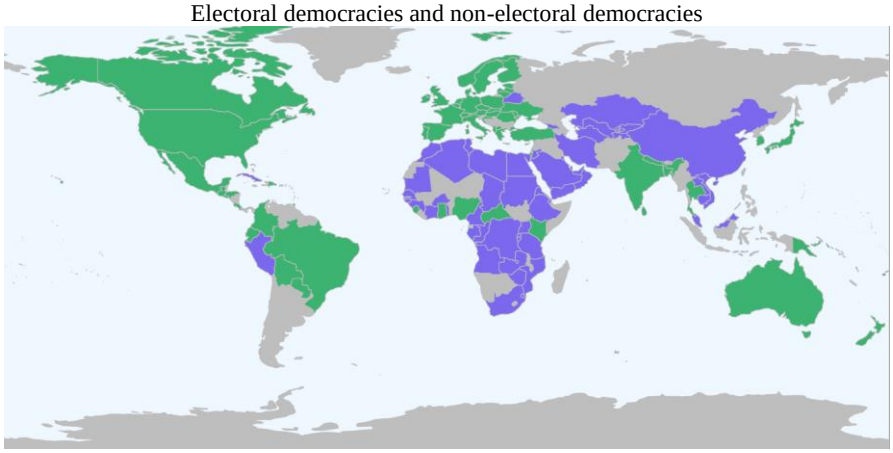
	Mean	Median	Std.dev.	Minimum	Maximum
Executive corruption	.50	.57	.29	.01	.97
Legislative corruption	.32	.13	1.57	-3.42	2.89

Notes: Analysis units = country averages from 1992-2006. The boxplots display z-scores. N=117. Std.dev. = Standard deviation.

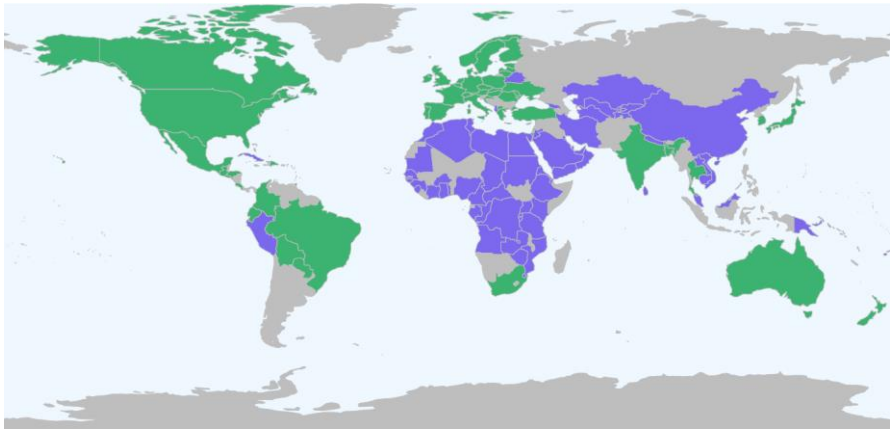
The global comparative sample consisted of 53 established and 64 non-established democracies (see Figure 7.2.8). Of these, 61 countries were classified as electoral democracies and 56 as non-electoral democracies. In the developing-country sample, the two regime indicators were not perfectly correlated. The democracy-quality dimensions were highly correlated with each other. This was particularly true of vertical accountability and political rights, vertical accountability and civil rights, and political and civil rights. They also correlate highly with regime-type dummies. The world maps show little variation in democratic qualities among developed countries. For his reason, this study has concentrated on analysing the joint effects of globalisation and democratic qualities in developing countries. There are considerable country differences in democratic qualities among poor countries (see Figures 7.2.9 & 7.2.10). Moreover, democratic qualities also vary within countries. Countries that perform well on one democracy-quality dimension do not necessarily perform well on another. It is well known that nearly all Latin American countries could be classified as electoral democracies during the research period. They share high levels of vertical accountability, in comparison to their performance on political and civil rights. This justifies the approach chosen here – to study democratic qualities separately. The plots indicate that most observations exhibit relatively high values of vertical accountability as well as political and civil rights. By contrast, only half of countries worldwide can be found on the upper part of the empirical distribution of horizontal accountability.

Figure 7.2.8 Democracies and autocracies

Electoral democracies and non-electoral democracies



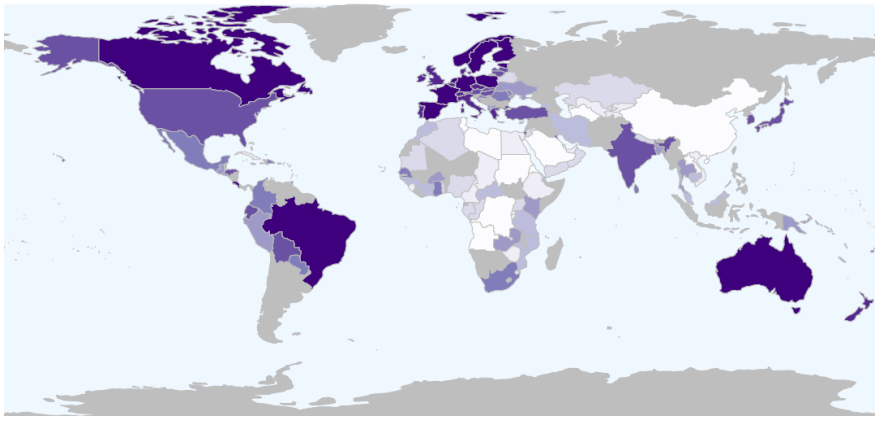
Established democracies and non-established democracies



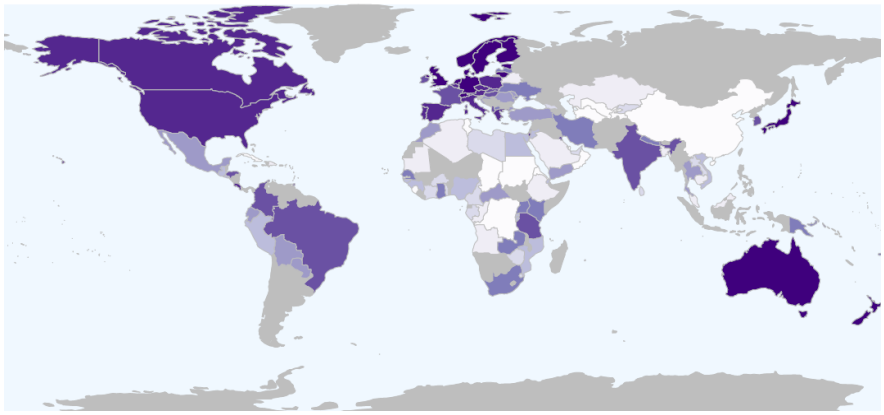
Notes: Green = electoral/ established democracies most years from 1992-2006, violet = non-electoral/ non-established democracies most years from 1992-2006. N=117. Missing countries are grey.

Figure 7.2.9 Country differences in democratic qualities

Vertical accountability



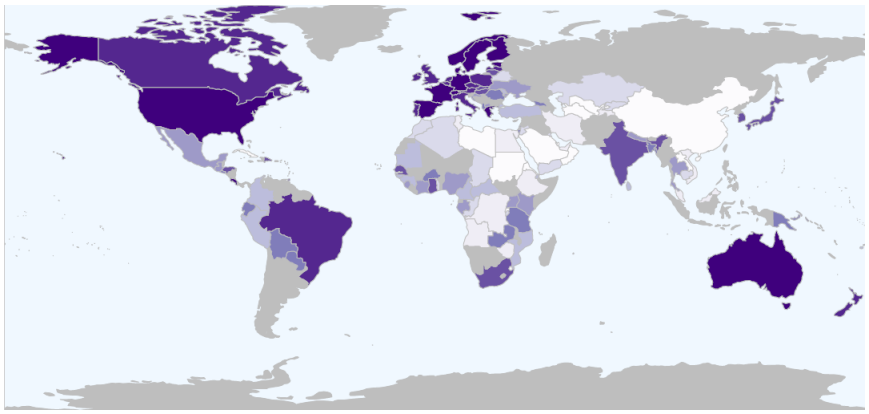
Horizontal accountability



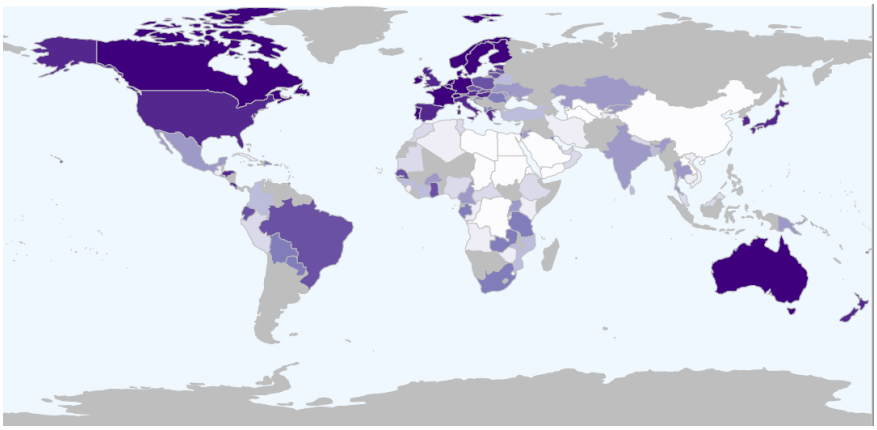
Notes: Analysis units = country averages from 1992-2006. N=117. The darker the colour the higher democracy quality. Missing countries are grey.

Figure 7.2.9 Country differences in democratic qualities (continuation)

Political rights

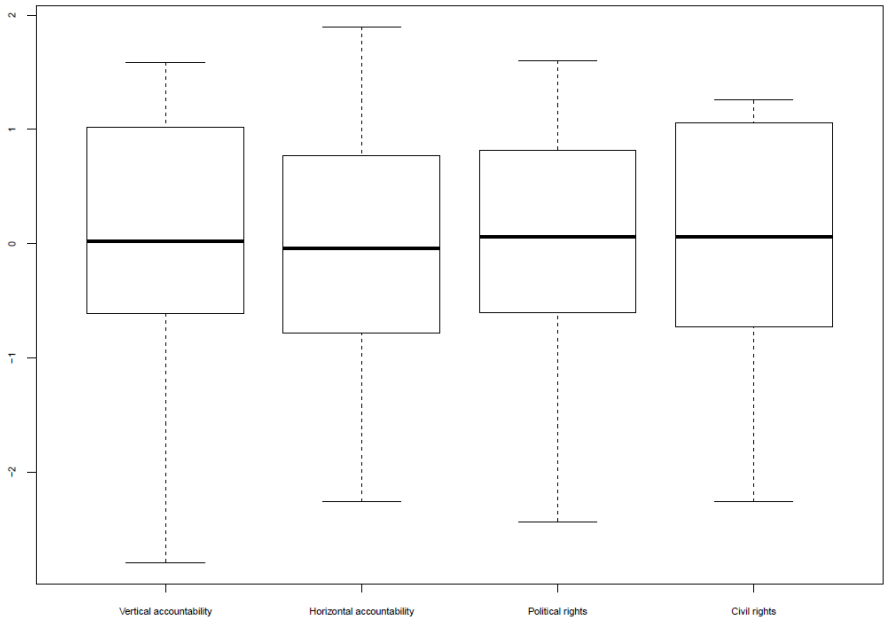


Civil rights



Notes: Analysis units = country averages from 1992-2006. N=117. The darker the colour the higher democracy quality. Missing countries are grey.

Figure 7.2.10 Worldwide variation in democratic qualities



	Mean	Median	Std.dev.	Minimum	Maximum
Vertical accountability	.61	.63	.78	-3.42	2.89
Horizontal accountability	.42	.38	.97	-1.76	2.25
Political rights	.68	.73	.89	-1.50	2.11
Civil rights	.67	.68	.26	.08	.99

Notes: Analysis units = country averages from 1992-2006. The boxplots display z-scores. N=117. Std.dev. = Standard deviation.

7.3 Ratification of the UNFCCC

This section examines the relationship between international integration, domestic political institutions, and UNFCCC ratification. Section 7.3.1 begins by analysing additive effects of globalisation. The following section (7.3.2) tests joint effects with domestic political institutions. To this end, marginal-effects plots are examined. To avoid problems with multicollinearity, highly correlated independent variables (>.7) are not included in the same model. These include: state memberships in IGOs and state centrality in IGO networks (developing-country sample, 1992–2006), policy diffusion and mean regional commitment, the presence of a right-wing veto player and right-wing government ideology, electoral and established democracy, established democracy and the presence of a right-wing veto player, government fragmentation and the presence of a right-wing veto player, as well as political and civil rights. Moreover, vertical accountability is highly correlated with horizontal, political, and civil rights (>.7). There are no problematic correlations between executive and legislative corruption. Correlations are presented in Chapter A7.2 in the annex.

7.3.1 International integration and UNFCCC ratification

To consider model complexity, the first models included only indicators of globalisation and control variables. All of the models controlled ENGO strength, industry-sector size, fuel exports, GDP per capita, population density, climate change vulnerability, and Annex I status (pooled analysis only). Next, in separate models, political institutional indicators of the three explanatory models – veto player, regime, type and political-corruption approach – were added.[74] Third, globalisation and control variables, as well as significant institutional variables, were examined simultaneously. The final step also considered additional controls, such as regional commitment. Only the models used in this final step are presented in Tables 7.3.1 and 7.3.2. The tables present beta coefficients. They describe the effect of an independent variable on the occurrence of the ratification of the UNFCCC (Jahn, 2013, p. 402). Positive or negative signs indicate whether the independent variable increases or decreases the hazard rate, i.e. the probability that ratification occurred in a certain time period (Fredriksson & Gaston, 2000, p. 352; Wenzelburger et al., 2014, pp. 166, 170, 190). Among various controls, ENGO strength contributes as expected to UNFCCC ratification ($H_{cont}4$) The positive effect of the number of ENGOs is not significant in all models in the analysis of developing countries. In contrast to theoretical expectations, climate change vulnerability undermines quick ratification ($H_{cont}15$); Non-Annex I parties ratified the treaty faster than Annex I parties to the agreement ($H_{cont}16$).

No stable relationship has been shown between economic openness and UNFCCC ratification. The negative effect of trade openness becomes insignificant when regional commitment is controlled. Policy diffusion among trading partners contributes to UNFCCC ratification. Regional commitment has a significant positive effect on UNFCCC ratification as well ($H_{cont}8$).[75] While the effect of regional commitment remains stable in a separate analysis of developing countries, the effect of policy diffusion becomes insignificant. In sum, as expected, economic globalisation does not matter to UNFCCC ratification. In accordance with the theoretical expectations, international political integration, captured by IGO memberships or state centrality in IGO networks, contributes to a faster ratification of the UNFCCC in all models ($H_{Int}4.1$). In the separate analysis of developing countries, the positive effect of international political integration stays significant.

There is no support for the hypothesis that institutional constraints or institutional quality matter to UNFCCC ratification. As expected, the policy preferences of veto players (presence of a right-wing veto player, government ideology) as well as veto points make no difference. The effect of a right-wing veto player is negative but insignificant. Positive effects of bicameralism and presidential veto-player status become insignificant when regional commitment is controlled. The separate analysis of developing countries indicates also no significant effects of policy preferences of veto players and specific veto points. Executive and legislative corruption contribute to UNFCCC ratification in the global comparative analysis when regional commitment is controlled. Both effects are insignificant in the analysis of developing countries ($H_{Corr}2.1.2$ & $H_{Corr}2.2.2$). There are no significant differences in UNFCCC ratification between democracies and autocracies. Among democracy-quality dimensions, the findings of pooled analysis indicate that political and civil rights in separate models contribute to the ratification of the Convention when regional commitment is controlled. Yet, in the separate analysis of developing countries there is neither a significant effect of regime type nor of specific democracy-quality dimensions ($H_{Dem}5.1.2$ & $H_{Dem}5.2.2$).

[74] The results of the first two steps are presented in Tables A7.3.1–A7.3.9 in chapter A7.3 in the annex.
[75] Both variables cannot be tested simultaneously because of their high bivariate correlation.

Table 7.3.1 International integration, domestic political institutions, and UNFCCC ratification (Global comparative analysis)

	Global comparative analysis			
	(1)	(2)	(3)	(4)
Economic development (ln)	-.075 *.928* (.133)	-.095 *.910* (.133)	-.072 *.931* (.136)	-.100 *.904* (.136)
Industry sector size (ln)	-.225 *.799* (.376)	-.181 *.834* (.385)	-.175 *.840* (.389)	-.143 *.867* (.399)
Fuel exports (ln)	-.045 *.956* (.097)	-.046 *.955* (.097)	.014 *1.015* (.098)	.009 *1.009* (.098)
ENGO strength (ln)	.361** *1.435* (.146)	.372*** *1.450* (.140)	.211 *1.235* (.148)	.244* *1.277* (.142)
Population density (ln)	-.047 *.954* (.091)	-.051 *.950* (.090)	-.063 *.939* (.089)	-.070 *.932* (.088)
Climate change vulnerability	-4.351*** *.013* (1.113)	-4.283*** *.014* (1.125)	-4.868*** *.008* (1.080)	-4.793*** *.008* (1.095)
Annex I	-.863** *.422* (.387)	-.815** *.443* (.380)	-1.268*** *.281* (.408)	-1.187*** *.305* (.400)
Regional climate commitment			3.749*** *42.50* (.662)	3.727*** *41.54* (.661)
Executive corruption	-.649 *.522* (.607)	-.552 *.576* (.626)	-.884 *.413* (.603)	-.791 *.453* (.629)
Political rights	.126 *1.135* (.165)		.213 *1.238* (.162)	
Civil rights		.535 *1.707* (.557)		.664 *.1.943* (.571)
Trade openness (lg)	-1.181* *.307* (.676)	-1.296* *.274* (.698)	-.965 *.381* (.701)	-1.054 *.348* (.718)
Capital openness (ln)	.151 *1.163* (.134)	.159 *1.172* (.135)	.10 *1.106* (.133)	.106 *1.112* (.134)
Policy diffusion (UNFCCC)	1.154* *3.172* (.596)	1.213** *3.363* (.593)		
IGO memberships	.016** *1.016* (.007)	.015** *1.02* (.007)	.013** *1.101* (.006)	.014** *1.014* (.006)
N	412	412	412	412
LR chi square	55.8	56.21	79.45	79.03
Countries		117		

Notes: The table presents beta coefficients, hazard ratios (in italics), and standard errors (in parentheses), * $p < .1$, ** $p < .05$, *** $p < .01$.

Table 7.3.2 International integration, domestic political institutions, and UNFCCC ratification (Analysis of developing countries)

	Developing countries			
	(1)	(2)	(3)	(4)
Economic development (ln)	-.000 *1.00* (.190)	.033 *1.034* (.194)	.008 *1.008* (.194)	.022 *1.023* (.197)
Industry sector size (ln)	-.370 *.691* (.461)	-.493 *.611* (.471)	-.340 *.712* (.473)	-.453 *.636* (.486)
Fuel exports (ln)	-.227* *.797* (.120)	-.232* *.793* (.119)	-.182 *.833* (.115)	-.183 *.832* (.116)
ENGO strength (ln)	.277 *1.319* (.188)	.279 *1.322* (.181)	.108 *1.114* (.198)	.156 *1.169* (.189)
Population density (ln)	-.054 *.947* (.125)	-.053 *.949* (.124)	-.115 *.891* (.125)	-.103 *.902* (.125)
Climate change vulnerability	-4.309*** *.013* (1.195)	-4.450*** *.012* (1.198)	-4.874*** *.008* (1.210)	-4.849*** *.008* (1.209)
Regional climate commitment			3.633*** *37.82* (1.152)	3.395*** *29.82* (1.149)
Executive corruption	-.678 *.508* (.776)	-.940 *.391* (.824)	-1.128 *.324* (.759)	-1.285 *.277* (.812)
Political rights	-.063 *.939* (.181)		.085 *1.089* (.186)	
Civil rights		-.681 *.506* (.655)		-.290 *.748* (.683)
Trade openness (lg)	.170 *1.858* (.837)	.384 *1.468* (.851)	-.022 *.978* (.892)	.231 *1.260* (.905)
Capital openness (ln)	.035 *1.036* (.166)	.026 *1.026* (.164)	.105 *1.110* (.168)	.085 *1.089* (.166)
Policy diffusion (UNFCCC)	1.049 *2.855* (.871)	.999 *2.716* (.866)		
IGO memberships	.031*** *1.032* (.009)	.034*** *1.034* (.009)	.024*** *1.025* (.009)	.027*** *1.027* (.010)
N	277	277	277	277
LR chi square	32.80	33.77	40.59	40.56
Countries		76		

Notes: The table presents beta coefficients, hazard ratios (in italics), and standard errors (in parentheses), * $p < .1$, ** $p < .05$, *** $p < .01$.

In sum, in accordance with the theoretical expectations, there is no support for the hypothesis that economic openness or policy diffusion via trading partners matters for UNFCCC ratification ($H_{treatydesign}2$). International political integration, however, contributes to faster ratification of the UNFCCC ($H_{Int}4.1.2$). In accordance with conclusions drawn from the literature on treaty design and international cooperation, there is no support for the hypothesis that domestic institutional explanatory factors matter to UNFCCC ratification ($H_{treatydesign}3$). However, the explanatory power of indicators drawn from the veto-player approach must be considered (see previous section).

7.3.2 Joint influence of international integration and domestic political institutions

Does the effect of globalisation on UNFCCC ratification depend on domestic political institutions? This study has not only tested hypotheses involving interactions discussed in Chapter 5. It has also analysed the potential two-way interaction effects of all international integration dimensions with all variables in the three explanatory approaches (veto-player approach, political-corruption approach and regime-type approach). Most developed countries ratified the UNFCCC fast (see also Gupta, 2010, p. 639). This chapter starts with the analysis of developing countries and then tests the stability of the result in the global analysis. The reason for this is that all interactions that were significant in the global comparative analysis have become insignificant in the separate analysis of developing countries. Therefore, a final model has been developed, based on the sample of developing countries and tested for the global comparative sample. Following Brambor et al. (2006) marginal-effects plots have been used to interpret interaction effects and evaluate their significance.[76] The constituent terms of interaction effects are mean-centred to avoid problems with non-essential multicollinearity. All models have controlled for GDP per capita, industry-sector size, fuel exports, ENGO strength, population density, climate change vulnerability, and Annex I status. As the previous section has shown that regional commitment affects UNFCCC ratification, this

[76] A statistically significant interaction term does not necessarily mean that the interaction effect is significant and an insignificant interaction effect does not mean the effect of international integration is insignificant at all values of the moderator variable (Brambor et al., 2006; Esarey & Summer, 2017, p. 1145).

variable has been included in place of policy diffusion. Exceptions include the models that examine interactions between policy diffusion and domestic political institutions.

To consider model complexity, this study has first tested interaction effects in separate models. A survival analysis has no comparable R square statistic. Therefore, in a second step, significant interactions of the same globalisation indicator and explanatory approach have been tested simultaneously. Third, significant interaction effects with different globalisation indicators of the same explanatory approach have been examined in the same model. Finally, stable significant interaction effects of all three explanatory models have been tested together. The following section present the results from the second and third steps only.

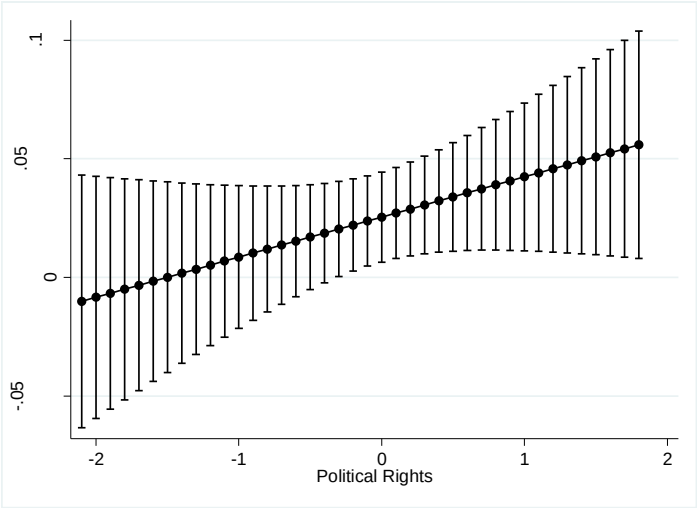
With regard to the veto-player approach, there is a positive effect of IGO memberships and centrality in IGO networks in democracies without a left- or right-wing government ideology or veto points (bicameralism, presidential veto point, government fragmentation, becoming stronger with number of government parties). In addition, policy diffusion contributes to UNFCCC ratification in democratic countries with a left-wing government ideology, as well as in democracies with a presidential veto player. Because of the low variation in the veto player variables, these results suggest that political globalisation contributes to climate commitment in non-democracies. There is no interaction between economic openness and political-corruption dimensions (executive and legislative corruption). This study also finds no support for the claim that executive or legislative corruption moderate the effect of policy diffusion. The positive effect of international political integration captured by IGO memberships or network centrality on UNFCCC ratification becomes stronger with executive corruption and weaker with legislative corruption. These effects are significant only at average levels of corruption.

With regard to regime type, there is a positive effect of capital openness in electoral and established democracies. Policy diffusion contributes to UNFCCC ratification in electoral democracies. IGO memberships and network centrality have a positive effect in non-electoral democracies and non-established democracies. Moreover, the positive effect of IGO memberships on UNFCCC ratification becomes stronger with vertical accountability and political and civil rights. It is also significant for average and high values of political rights. In contrast to the other democratic qualities, the positive effect of IGO memberships reduces with horizontal accountability. By contrast, the positive effect of network centrality increases with checks and balances. In a simultaneous analysis (political rights and IGO memberships, horizontal accountability and IGO memberships, electoral democracy and IGO memberships, electoral democracy and capital openness, electoral democracy and policy diffusion), all interaction effects remain stable. The results remain the same when network centrality is used in place of IGO memberships. The interaction of IGO memberships with political rights is included in place of vertical accountability or civil rights, as it is the clearest effect in the marginal-effects plot. The interactions with electoral democracy, as opposed to established democracy, have been tested, since policy diffusion interacts only with electoral democracy (see above).

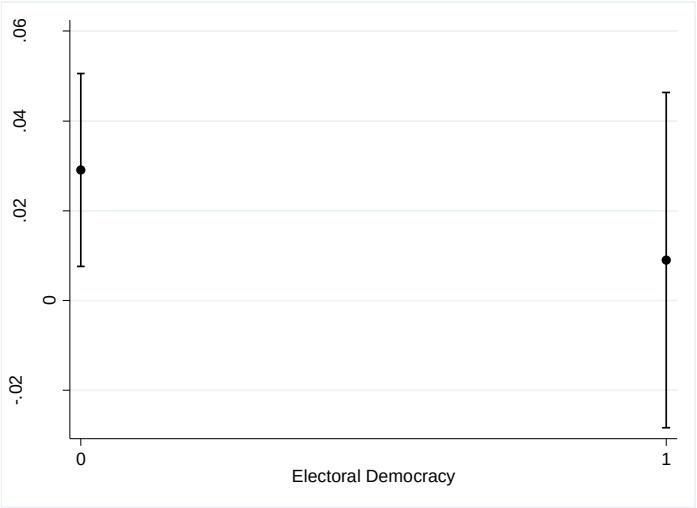
The final section of this chapter examines the significant interaction effects of the three explanatory models simultaneously. This model includes the interactions of policy diffusion with left-wing government ideology, policy diffusion and presidential veto player, interactions of IGO memberships with veto points (presidential veto player, government fragmentation, bicameralism) and left-wing and right-wing government ideology, interactions of IGO memberships with executive and legislative corruption, interactions of IGO memberships with electoral democracy, political rights and horizontal accountability, capital openness and electoral democracy and policy diffusion and electoral democracy. All effects remain significant. To test model complexity, this study has also estimated the model without the interactions of IGO memberships with veto points and government ideology, as these imply that IGO memberships have a positive effect on climate commitment in non-democracies. All effects remain significant. Yet, in the jack-knife analysis based on world regions (IIASA, 2004), only the interaction effects of IGO with political rights, as well as electoral democracy, are significant.

Figure 7.3.1 International political integration, political rights, electoral democracy, and UNFCCC ratification (Developing countries)

90% c.i.



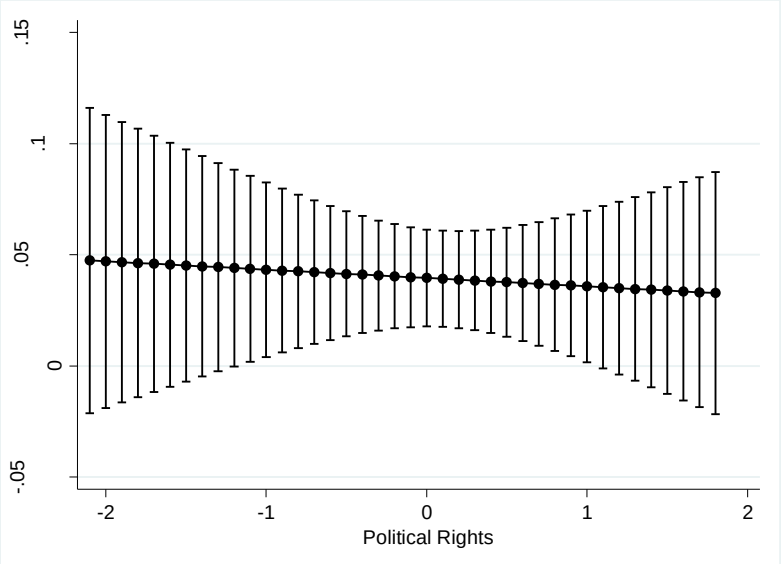
95% c.i.



Notes: Marginal effect plot. Analysis units = country-years from 1992-2006. N=76. International political integration measured by IGO memberships. Control of trade and capital openness, regional commitment, economic development, ENGO strength, industry size, fuel exports, population density, climate change vulnerability. Simultaneous analysis of the interaction effects of IGO memberships and political rights and IGO memberships and electoral democracy. c.i. = confidence interval.

Figure 7.3.1 presents the results of this final model. The positive effect of IGO memberships becomes weaker with political rights in developing countries without North African countries (jack-knife analysis) (see Figure 7.3.2). This effect is only significant for countries with average values of political rights. In the analysis of the pooled sample (see Figure 7.3.3) the interaction between political globalisation and political rights is significant only for average values of political rights. In this analysis, the positive effect of IGO memberships does not become weaker with political rights. The results remain the same when network centrality is applied as an indicator of international political integration.

Figure 7.3.2 International political integration, political rights, and UNFCCC ratification (Developing countries)



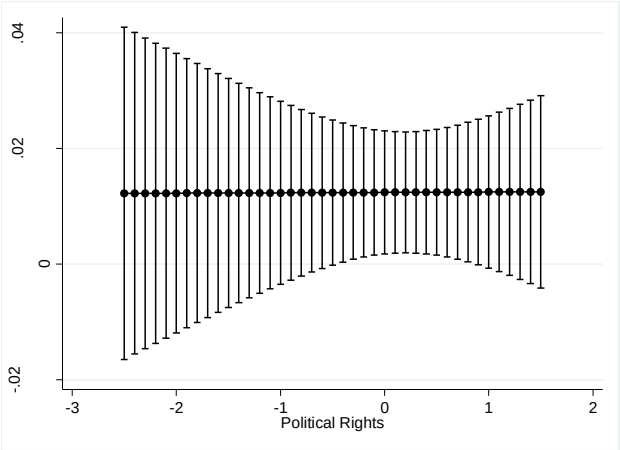
Notes: Marginal effect plot, 95% confidence interval. Analysis units = country-years from 1992-2006. Analysis without North African countries. Control of trade and capital openness, regional commitment, economic development, ENGO strength, industry size, fuel exports, population density, climate change vulnerability. Simultaneous analysis of the interaction effects of IGO memberships and political rights and IGO memberships and electoral democracy.

These results remains stable when democratic and autocratic sub-types are controlled, as well as when regional commitment, EU membership, electoral size urban-population size, country size, and economic growth is controlled (see Section A7.6 in the annex). This also applies to the analysis of additional controls in separate regression models. The model has a good model fit (see A7.5.1 in the annex). There are no violations of the model assumptions (see A7.5.2 in the annex). Regarding control variables, as expected, regional commitment contributes to UNFCCC ratification ($H_{cont}12$) (see Tables 7.3.3 & 7.3.4). $H_{cont}15$ indicated no clear relationship between climate change vulnerability and climate commitment. By contrast, the statistical analysis shows that more vulnerable states ratified the UNFCCC later. The analysis of developing countries suggests that monarchies are less likely than military autocracies (reference category) to ratify the UNFCCC.

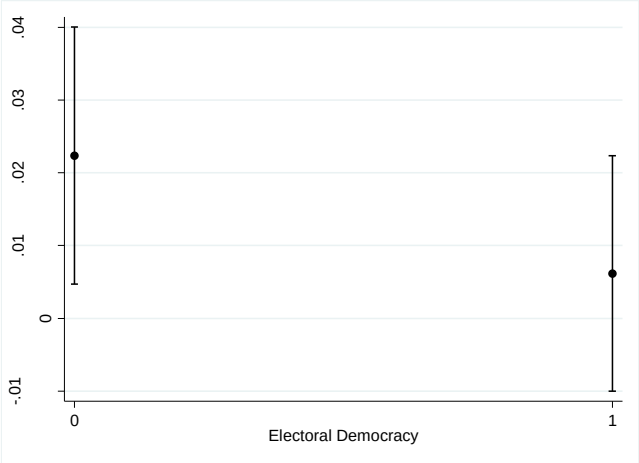
To conclude, in accordance with hypothesis $H_{xdemocracy}1a$, international political integration only contributes to UNFCCC ratification in non-democracies. In accordance, in developing countries, the positive effect of political globalisation becomes weaker with political rights. IGO involvement contributes to climate commitment in countries with average levels of political rights. The policy preferences of veto players, veto points, and political corruption do not influence the effects of globalisation on climate commitment. Before discussing these results in Section 7.5, the next section examines Kyoto Protocol ratification.

Figure 7.3.3 International political integration, political rights, electoral democracy, and UNFCCC ratification (Global comparative analysis)

90% c.i.



95% c.i.



Notes: Marginal effect plot. Analysis units = country years from 1992-2006. N=117. International political integration measured by IGO memberships. Control of trade and capital openness, regional commitment, economic development, ENGO strength, industry size, fuel exports, population density, climate change vulnerability and Annex I status. Separate analysis of interactions of IGO memberships with political rights and electoral democracy to avoid problems with multicollinearity. c.i. = confidence interval.

Table 7.3.3 International political integration, political rights, electoral democracy, and UNFCCC ratification (Global comparative analysis)

	Global comparative analysis	
	(1)	(2)
Economic development (ln)	.014 *1.014*	.078 *1.082*
	(.139)	(.137)
Industry sector size (ln)	-.401 *.670*	-.629 *.533*
	(.410)	(.412)
Fuel exports (ln)	.018 *1.018*	-.024 *.976*
	(.103)	(.105)
ENGO strength (ln)	.289* *1.334**	.431*** *1.538****
	(.157)	(.152)
Population density (ln)	-.042 *.959*	-.051 *.950*
	(.088)	(.088)
Climate change vulnerability	-4.779*** *.008****	-4.893*** *.007****
	(1.073)	(1.088)
Regional commitment	3.651*** *38.503****	3.436*** *31.069****
	(.676)	(.669)
Annex I	-1.155*** *.315****	-1.013*** .363***
	(.393)	(.388)
Civilian dictatorship	-.263 *.769*	-.099 *.906*
	(.291)	(.358)
Monarchy	-.219 *.803*	-.447 *.640*
	(.461)	(.494)
Political rights	.248 *1.281*	
	(.193)	
Electoral democracy		-.005 *.995*
		(.392)
Trade openness	-.899 *.407*	-.825 *.438*
	(.755)	(.761)
Capital openness	.144 *1.154*	.174 *1.190*
	(.130)	(.135)
IGO memberships	.012* *1.012**	.024** *1.024***
	(.007)	(.009)
IGO memberships x Political rights	-.000 *1.000*	
	(.006)	
IGO memberships x Electoral democracy		-.019 *.982*
		(.012)
N	412	412
LR chi square	78.23	78.85
Countries	117	

Notes: The table presents beta coefficients, hazard ratios (in italics), and standard errors (in parentheses), * $p < .1$, ** $p < .05$, *** $p < .01$.

Table 7.3.4 International political integration, political rights, and electoral democracy (Analysis of developing countries)

	Developing countries	
	(1)	(2)
Economic development (ln)	.049 *1.050*	.117 *1.124*
	(.198)	(.200)
Industry sector size (ln)	-.553 .575	-.526 .591
	(.513)	(.504)
Fuel exports (ln)	-.186 *.830*	-.279** *.756***
	(.118)	(.133)
ENGO strength (ln)	.237 *1.267*	.379* *1.461**
	(.206)	(.225)
Population density (ln)	-.111 *.895*	-.093 *.912*
	(.131)	(.129)
Climate change vulnerability	-4.486*** *.011****	-4.897*** *.007****
	(1.172)	(1.198)
Regional commitment	3.623*** *37.432****	3.402*** *30.028****
	(1.185)	(1.190)
Civil dictatorship		-.060 *.942*
		(.447)
Monarchy		-1.206* *.299**
		(.672)
Political rights	.170 *1.186*	.021 *1.021*
	(.240)	(.273)
Electoral democracy	.019 *1.020*	-.186 *.830*
	(.397)	(.533)
Trade openness	-.262 *.769*	.000 *1.000*
	(.906)	(.989)
Capital openness	.136 *1.145*	.169 *1.184*
	(.172)	(.177)
IGO memberships	.032*** *1.032****	.039*** *1.021****
	(.012)	(.013)
IGO memberships x Electoral democracy	-.020 *.980*	-.027 *.973*
	(.022)	(.022)
IGO memberships x Political rights	.017 *1.017*	.017 *.017*
	(.012)	(.012)
N	277	277
LR chi square	40.31	44.11
Countries	76	

Notes: The table presents beta coefficients, hazard ratios (in italics), and standard errors (in parentheses), * $p < .1$, ** $p < .05$, *** $p < .01$.

7.4 Ratification of the Kyoto Protocol

This chapter presents the results of the analysis of Kyoto Protocol ratification. As discussed above, the first section examines additive effects of domestic political institutions and international integration. The subsequent section tests joint effects of domestic political institutions and international integration. The analysis of Kyoto Protocol ratification examines the pooled sample from 1998 to 2006. To provide a robustness analysis, the developing-country sample is examined. As explained, EU member states are treated as a single case. To avoid problems with multicollinearity, due to high bivariate correlations (>.7), the following variables have not been tested simultaneously: democracy-quality dimensions, IGO memberships and state centrality in IGO networks, electoral/established democracy and vertical accountability, electoral accountability and political rights, electoral/established democracy and government fragmentation, established democracy and right-wing veto player, policy diffusion via trading partners and regional commitment (see Chapter A7.2).

7.4.1 International integration and Kyoto Protocol ratification

As in the analysis of UNFCCC ratification, the first models only included indicators of globalisation and control variables. Models of the additive analysis controlled ENGO strength, industry-sector size, fuel exports, economic development, population density, climate change vulnerability and Annex I status (see Tables 7.4.1 & 7.4.2). Second, political institutional indicators of the three explanatory models – veto player, regime type, and political-corruption approach – were added to separate models.[77] Third, globalisation and control variables, as well as significant institutional variables, have been examined simultaneously. In this final step, additional controls such as regional commitment, have also been considered. Only models of this final step are presented below. Among the controls, countries with high levels of population density ratified the Kyoto Protocol more quickly. This supports $H_{cont}16a$. Models that also consider regional commitment indicate that Annex I countries are less likely to ratify the Kyoto Protocol quickly. There is no support for the hypothesis that economic globalisation matters for Kyoto Protocol ratification. The negative effect of trade openness is significant in some models only. In addition, policy diffusion via trading partners does not influence climate commitment. Ratification by countries in the same region significantly hastens Kyoto Protocol ratification. There is no stable support for the claim that IGO memberships or network centrality contribute to Kyoto Protocol ratification. These findings remain stable in the separate analysis of developing countries.

There is no support for the hypothesis that the presence of a right-wing veto player or democratic veto points – government fragmentation, presidential veto power, or the veto power of the upper legislative chamber – affect Kyoto Protocol ratification. This applies to the analysis of the pooled and developing-country samples. A significant positive effect of right-wing government ideology on Kyoto Protocol ratification in the separate analysis of developing countries becomes insignificant in the final model. The data does not confirm that the presence of a right veto player or government fragmentation delay the ratification of hard climate treaties ($H_{Veto}1.21$, $H_{Veto}1.2.2$, $H_{Veto}2.2.1$, & $H_{Veto}2.2.2$).These findings indicate that neither executive nor legislative corruption matter to Kyoto Protocol ratification ($H_{Corr}1.2.1$, $H_{Corr}1.2.2$, $H_{Corr}2.2.1$, & $H_{Corr}2.2.2$). The statistical findings also indicate that regime type and democracy-quality dimensions do not affect climate commitment. There is no support that political rights contribute to Kyoto Protocol ratification (HDem4.2.1 & H4.2.2). The positive effects of vertical accountability and electoral democracies become insignificant when regional commitment is controlled. The results suggest that established democracies did ratify the Kyoto Protocol more quickly. However, this result is insignificant in the analysis of developing countries. Regarding the control hypotheses, the data support that densely populated countries are more committed ($H_{cont}7a$) and that regional commitment contributes to Kyoto Protocol ratification ($H_{cont}12$). In contrast to $H_{cont}16$, Annex I parties are more likely to ratify the Kyoto Protocol quickly than Non-Annex I parties.

[77] The results of the first two steps are presented in Tables A7.4.1–A7.4.10 in chapter A7.4 in the annex.

Table 7.4.1 International integration, domestic political institutions, and Kyoto Protocol ratification (Global comparative analysis)

	Global comparative analysis		
	(1)	(2)	(3)
Economic development (ln)	-.168 *.846* (.175)	-.173 *.841* (.177)	-.134 *.874* (.178)
Industry sector size (ln)	.768* *2.154* (.423)	.577 *1.780* (.450)	.873* *2.395* (.465)
Fuel exports (ln)	-.002 *.998* (.109)	.040 *1.040* (.114)	.021 *1.021* (.115)
ENGO strength (ln)	-.092 *.912* (.172)	-.099 *.906* (.177)	-.156 *.855* (.174)
Population density (ln)	.311*** *1.364* (.112)	.289** *1.335* (.114)	.293*** *1.340* (.112)
Climate change vulnerability	.307 *1.359* (1.299)	.676 *1.965* (1.316)	-.572 *.564* (1.242)
Regional commitment			4.146*** *63.18* (.877)
Annex I	-1.098** *.334* (.515)	-1.299** *.273* (.549)	-1.450*** *.235* (.495)
Right government ideology		.173 *1.189* (.399)	
Political corruption	-.177 *.838* (.778)	-.232 *.793* (.815)	-.559 *.572* (.801)
Established Democracy	1.059*** *2.883* (.302)	1.149*** *3.154* (.344)	.643** *1.903* (.316)
Trade openness (lg)	-1.353 *.259* (.877)	-1.408 *.245* (.917)	-1.602* *.202* (.871)
Capital openness (ln)	.154 *1.166* (.157)	.133 *1.143* (.171)	.094 *1.099* (.155)
Policy diffusion	.553 *1.738* (.932)	.209 *1.233* (.966)	
IGO memberships	.015 *1.015* (.009)	.015 *1.015* (.010)	.015* *1.015* (.009)
N	573	560	573
LR chi square	35.33	37.95	60.12
Countries		96	

Notes: The table presents beta coefficients, hazard ratios (in italics), and standard errors (in parentheses), * $p < .1$, ** $p < .05$, *** $p < .01$.

Table 7.4.2 International integration, domestic political institutions, and Kyoto Protocol ratification (Analysis of developing countries)

	Developing countries		
	(1)	(2)	(3)
Economic development (ln)	.060 *1.062* (.217)	.117 *1.124* (.234)	-.061 *.941* (.225)
Industry sector size (ln)	.424 *1.529* (.534)	.371 *1.450* (.554)	.407 *1.502* (.539)
Fuel exports (ln)	-.004 *.996* (.124)	-.009 *.991* (.128)	.053 *1.055* (.125)
ENGO strength (ln)	-.009 *.991* (.192)	-.030 *.970* (.196)	-.090 *.914* (.196)
Population density (ln)	.578*** *1.782* (.158)	.538*** *1.713* (.159)	.494*** *1.639* (.151)
Climate change vulnerability	1.021 *2.775* (1.369)	.923 *2.516* (1.348)	.252 *1.287* (1.356)
Regional commitment			3.797*** *44.59* (1.185)
Right government ideology		.699 *2.011* (.519)	
Political corruption	-.976 *.377* (.863)	-.523 *.592* (.911)	-1.005 *.366* (.908)
Established democracy	.767** *2.154* (.344)	.674 *1.961* (.414)	.416 *1.516* (.367)
Trade openness (lg)	-1.233 *.292* (.988)	-1.624 *.197* (1.057)	-.867 *.420* (.941)
Capital openness (ln)	.268 *1.307* (.182)	.304 *1.355* (.197)	.192 *1.212* (.185)
Policy diffusion	.524 *1.689* (1.028)	.032 *1.032* (1.081)	
IGO memberships	.014 *1.014* (.010)	.010 *1.010* (.011)	.016 *1.016* (.010)
N	442	431	442
LR chi square	39.12	40.68	49.81
Countries		76	

Notes: The table presents beta coefficients, hazard ratios (in italics), and standard errors (in parentheses), * $p < .1$, ** $p < .05$, *** $p < .01$.

In sum, there is no effect of economic or political-globalisation dimensions on Kyoto Protocol ratification. In accordance with $H_{treatydesign}2$ international economic integration neither affects UNFCCC nor Kyoto Protocol ratification. In contrast to $H_{treatydesign}3$, which claimed that domestic political institutions mattered to Kyoto Protocol ratification, the present study finds that the political institutional variables considered in the analysis have no stable significant effects.

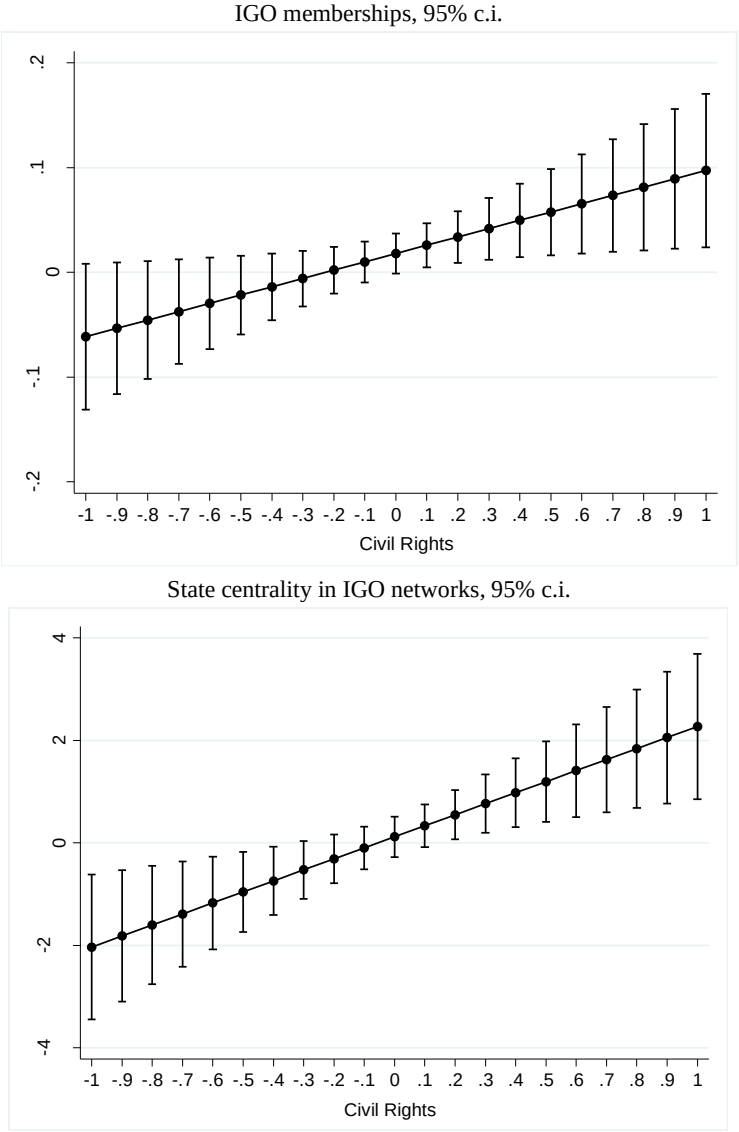
7.4.2 The joint effects of international integration and domestic political institutions

The following section tests the hypotheses of the three explanatory models on the joint influence of international integration and domestic political institutions. To develop a final model, the first step involved adding interaction terms to separate regression models to consider model complexity. In a second step, significant interactions of the same globalisation indicator and explanatory approach were tested simultaneously. Third, significant interaction effects of the variables associated with each explanatory approach were examined simultaneously with different globalisation indicators from the same explanatory approach. In the final step, significant interaction effects of the different explanatory models were tested simultaneously. In comparison to the analysis of UNFCCC ratification, this section examines the global comparative sample and tests the robustness of the final model with the developing-country sample. All models control ENGO strength, industry sector size, fuel exports, economic development, population density, climate change vulnerability and Annex I status. Models that do not test interactions with policy diffusion via trading partners control for regional commitment. The following section reports the results of the third step, i.e. the significant interactions of each explanatory approach, before examining the results of the final step.

In simultaneous analysis of the significant interactions of the explanatory variables in the veto-player approach with the globalisation dimensions, there is a stable significant negative effect of trade openness in countries with left-wing governments or presidential veto players, as well as a positive effect of capital openness in bicameral democracies and countries with left-wing governments. There are no stable significant interactions between veto-player-approach variables and international political integration (IGO memberships or state centrality in IGO networks) or policy diffusion. With regard to the political-corruption approach, trade openness is known to have

delayed Kyoto Protocol ratification in countries with below-average levels of executive/legislative corruption, while policy diffusion contributes to Kyoto Protocol ratification in countries with below-average levels of legislative corruption and IGO memberships (or state centrality in IGO networks) contribute in countries with below-average levels of executive/legislative corruption. The analysis of the regime-type approach suggests that trade openness delays Kyoto Protocol ratification in non-established democracies as well as in countries with average civil rights. In addition, international political integration, captured by IGO memberships or network centrality, contributes to Kyoto Protocol ratification in countries with above-average civil rights.

Figure 7.4.1 International political integration, civil rights, and Kyoto Protocol ratification (Global comparative analysis)



Notes: Marginal effect plot. Analysis units = country-years from 1992-2006. N=96. The multivariate models includes trade openness, capital openness, policy diffusion, IGO memberships/ network centrality, civil rights, political corruption, ENGO strength, industry sector size, fuel exports, economic development, population density, climate change vulnerability, Annex I status, and the interaction of IGO memberships/ network centrality with civil rights. c.i. = confidence interval.

In the simultaneous analysis of significant interactions of the three explanatory models, the positive effect of IGO memberships in countries with above-average civil rights, the positive effect of policy diffusion in countries with legislative corruption, the interaction between trade openness and legislative corruption and the positive effect of capital openness in countries with left-wing governments all remain stable. Jack-knife analysis based on world regions (IIASA, 2004) indicates that only the joint effect of IGO memberships and civil rights is significant. The result is the same when state centrality in IGO networks is used as an indicator of political globalisation. This final model is displayed in Figure 7.4.1. These findings remain stable when democratic and autocratic sub-types are controlled, as well as when regional commitment, electoral size, urban population size, country size, and economic growth are considered (see Section A7.6 in the annex). The results remain the same when the additional controls are added in separate regression models. The final model has a good model fit and no violations of the model

assumptions (see Chapters A7.5.1 & A7.5.2 in the annex). The result remains the same when only developing countries are examined.

While the economic-openness indicators are significant in the simultaneous analysis with interaction effect in Table 7.4.3, these effects are not stable in the robustness analysis (jack-knife analysis). The hazard ratio supports the finding that the joint effect of network centrality and civil rights has a substantial effect on climate commitment. As expected, regional commitment contributes to Kyoto Protocol ratification. In accordance with hypothesis $H_{cont}7a$, densely populated countries are more likely to ratify the Kyoto Protocol fast.

To conclude, as expected, economic openness/interdependence has no effect on Kyoto Protocol ratification. There are no joint effects of economic globalisation influence and veto players or political-corruption dimensions. In accordance with theoretical expectations, political corruption and the policy preferences of veto players cannot explain the relationship between globalisation and Kyoto Protocol ratification. Specific veto points do not moderate positive incentives derived from political globalisation. The statistical analysis supports hypothesis $H_{xdemocracy}2b$. There is a positive effect of international political integration, captured by IGO memberships or state centrality in IGO networks, on Kyoto Protocol ratification in countries with above-average levels of civil rights.

Table 7.4.3 International political integration, civil rights, and Kyoto Protocol ratification

	Global comparative analysis	**Developing countries**
Economic development (ln)	-.187 *.829* (.235)	.036 *1.037* (.274)
Industry sector size (ln)	1.427** *4.165*** (.700)	1.128 *3.089* (.810)
Fuels exports (ln)	-.167 *.846* (.145)	-.166 *.847* (.155)
ENGO strength (ln)	.033 *1.033* (.222)	.089 *1.093* (.235)
Population density (ln)	.374** *1.453*** (.148)	.583*** *1.792* *** (.189)
Climate change vulnerability	-.165 *.847* (1.486)	-.227 *.797* (1.576)
Regional commitment	4.630*** *102.564**** (1.081)	4.085*** *59.415**** (1.370)
Annex I	-.947 *.388* (.630)	
Political corruption	1.534 *4.635* (1.079)	1.146 *3.145* (1.197)
Civil rights	1.909** *6.748*** (.936)	1.509 *4.521* (.943)
Trade openness	-2.367** *.094* (1.131)	-1.912 *.148* (1.208)
Capital openness	.532** *1.703*** (.232)	.609** *1.838*** (.275)
Network centrality	.238 *1.269* (.203)	.265 *1.303* (.217)
Network centrality x Civil rights	1.481** *4.396* (.679)	1.626** *5.083*** (.778)
N	491	382
Countries	96	76
LR Chi2	60.30	49.70

Notes: The table presents beta coefficients, hazard ratios (in italics), and standard errors (in parentheses), * $p < .1$, ** $p < .05$, *** $p < .01$.

7.5 Discussion of the results

This chapter discusses the results of this study. Table 7.5.1 summarises the statistical findings on additive effects of globalisation on climate commitment. As expected, international economic integration does not matter to climate commitment. While policy diffusion via trading partners contributes to UNFCCC and Kyoto Protocol ratification, tests of regional ratification behaviour lead to the same result. The lack of any independent effect of economic globalisation may reflect the fact that countries often ratify climate treaties without intending to implement them. Moreover, as Chapter 3 has discussed, international economic integration has both positive and negative effects on climate commitment, ultimately producing no clear effect. While IGO involvement (in line with theoretical expectations) does contribute to UNFCCC ratification, political globalisation has no stable additive effect on Kyoto Protocol ratification.

Table 7.5.1 Summary of results: Globalisation and climate commitment

Independent variable	UNFCCC		Kyoto Protocol	
	Pooled	*Developing*	Pooled	*Developing*
Trade openness	$H_{Int}1.1.1$	/	$H_{Int}1.2.1$	/
	$H_{Int}1.1.2$	/	$H_{Int}1.2.2$	/
Capital openness	$H_{Int}2.1.1$	/	$H_{Int}2.2.1$	/
	$H_{Int}2.1.2$	/	$H_{Int}2.2.2$	/
Economic interdependence	$H_{Int}3.1.1$	+ (/)	$H_{Int}3.2.1$	+ (/)
	$H_{Int}3.1.2$	+ (/)	$H_{Int}3.2.2$	+ (/)
Political globalisation	$H_{Int}4.1.1$	+	$H_{Int}4.2.1$	/ (+)
	$H_{Int}4.1.2$	+	$H_{Int}4.2.2$	/ (+)

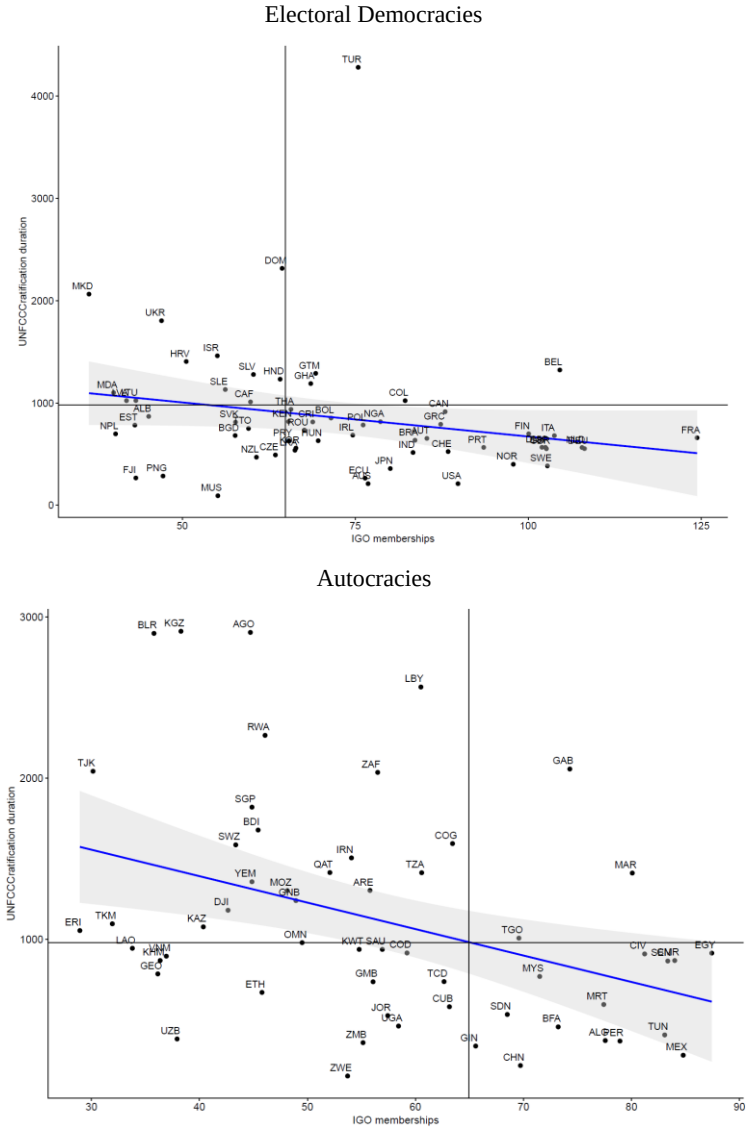
Notes: + positive effect, / no effect, - negative effect, +/- direction unclear. Green – empirical observed effect, red – theoretical expected effect that has not been supported by the empirical analysis.

With regard to explanatory approaches involving state responses to globalisation, there is no support for the hypothesis that the policy preferences of veto players or veto points influence the effect of international integration on climate commitment. Thus, in accordance with the theoretical expectations, there is no support for the hypothesis that government ideology or the presence of a right-wing veto-player moderates the effect of international integration on climate commitment. In contrast to the hypotheses, specific veto points do not influence the effect of international political integration on UNFCCC or Kyoto Protocol ratification ($H_{xveto}1–6$). However, the low explanatory power of these measures must be taken into account. There is likewise no support for the hypothesis that political corruption moderates the effect of international economic or political integration on climate commitment, captured by UNFCCC or Kyoto Protocol ratification ($H_{xcorr}1a,b$, $H_{xcorr}3$). Corrupt and non-corrupt governments react in similar ways to incentives derived from globalisation, when it comes to their ratification behaviour. These results support hypotheses derived from the regime-type approach. Additionally, the findings contribute to the literature on treaty design and international cooperation. The statistical analysis of climate commitment supports $H_{treatydesign}2$, confirming that there is no effect of international economic integration. There is likewise no support for the hypothesis that political globalisation matters more for soft treaties (UNFCCC) than for hard treaties (Kyoto Protocol) ($H_{treatydesign}1$). The results suggest, however, that it is important to consider treaty design when analysing the interaction effects between international political integration and regime type. IGO involvement contributes to UNFCCC ratification in autocracies only ($H_{xdemocracy}1b$). There are no general differences with regard to political globalisation and Kyoto Protocol ratification between democracies and autocracies. However, civil rights moderate the effect of international political integration on Kyoto Protocol ratification ($H_{xdemocracy2}b$). The following two sections discuss these interaction effects in more detail.

7.5.1 UNFCCC ratification

Political globalisation incentivises countries to join international climate cooperation. Following neoliberal institutionalist theory, it reduces transaction costs and uncertainty, contributes to issue linkages, and raises reputation costs. Following constructivist theory, world society theory, and social network theory, it distributes international environmental norms, raises legitimacy and reputational pressures, and promotes the influence of foreign governments and non-state actors at the international level. Chapter 5 argues that regime type moderates the positive effect of international political integration on UNFCCC ratification. In contrast to the theoretical expectation that democracies are more open to incentives related to political globalisation ($H_{xdemocracy}1a$), IGO involvement has been shown to contribute only in autocracies (non-electoral democracies) to UNFCCC ratification ($H_{xdemocracy}1b$). Accordingly, the positive effect of political globalisation is reduced in relation to political rights in poor countries. Figure 7.5.1 below shows that most electoral democracies, regardless of the number of IGO memberships they had, ratified the UNFCCC quickly, in comparison to the average ratification delay for all countries. There were some exceptions, however. Several electoral democracies with below-average numbers of IGO memberships took a long time to ratify the UNFCCC. These included the Dominican Republic, Israel, and Ukraine. In addition, several electoral democracies with an above-average number of IGO memberships took a long time to ratify the UNFCCC. Turkey was a bivariate outlier. Overall, the scatter plot supports the result of the multivariate analysis: there is no clear relationship between IGO memberships and UNFCCC ratification in electoral democracies. By contrast, political globalisation contributed to UNFCCC ratification in autocracies. Most non-democracies with an above-average number of IGO memberships ratified the UNFCCC fast. A few exceptions (Gabon, Morocco, Togo) took longer than the average ratification duration for all countries. Most autocracies involved with a below-average number of IGOs took more than the average ratification duration to enter the UNFCC. Ratification delay varied more among autocracies with a below-average number of IGO memberships.

Figure 7.5.1 International political integration and UNFCCC ratification delay in electoral democracies and autocracies (Global comparative analysis)



Notes: UNFCCC ratification duration = in days, IGO memberships = country average 1992-2006. Bivariate linear regression of the relationship in blue, 95% confidence interval in grey, vertical line = average number of IGO memberships, horizontal line = average UNFCCC ratification duration. Countries that are most years from 1992-2006 electoral democracies are classified as electoral democracies and all others as autocracies.

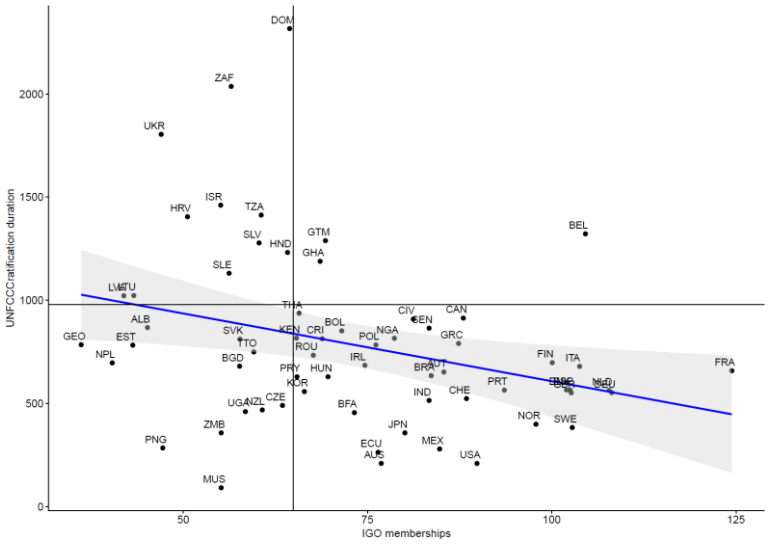
These results support the hypothesis that autocracies involved in IGOs ratify the UNFCCC to enhance their international reputations and legitimacy. The more autocracies are integrated in the international political system, the more they care about how they are perceived at the international level. They also join IGOs to show that they can cooperate with other states. The finding that international political integration contributes to UNFCCC ratification in autocracies is in line with the literature on non-democracies and the ratification of human rights treaties. Empirical research has shown that 'states with strong domestic institutions and poor human rights records are less likely to join human rights treaties than states with weaker domestic institutions that have similar rights records' (Hathaway, 2007, p. 613). Autocracies ratify human-rights agreements because they strive for international reputational status vis-a-vis foreign governments, IGOs, and NGOs (Hafner-Burton & Tsutsui, 2005; Hathaway, 2002; Simmons, 2009a, pp. 77f.; von Stein, 2013, p. 2). Hafner-Burton and Tusutsui (2005) have argued, in accordance with world society theory, that the more deeply autocracies are embedded in the international political system, the more they ratify human-rights treaties to gain international legitimacy (see Chapter 5). Thus, autocracies ratified the UNFCCC quickly to enhance their international reputations. Non-democracies, such as the Sudan, with above-average IGO membership values, ratified the UNFCCC as fast as established democracies. The reputation of the Sudan at the international level was low during the research period (BTI, 2018). While its government has entered into numerous international environmental treaties, it has made little effort to protect the environment (BTI, 2018, no page number; Ministry of Foreign Affairs of the Netherlands, no year, p. 3).

The statistical analysis finds no analogous finding for Kyoto Protocol ratification. This literature on autocracies and the ratification of human rights agreements explains also why this finding does not apply to Kyoto Protocol ratification. Autocracies only ratify human rights treaties with universal membership as long as they have no compliance measures, making it possible for governments to avoid implementing them at the domestic level (Hathaway, 2007; von Stein, 2013, p. 1). This applies to the UNFCCC. By contrast, the Kyoto Protocol stipulated that Non-Annex I countries would profit from climate change mitigation measures implemented by developed countries in the developing world. Thus, regime type cannot explain the relationship between international political integration and Kyoto Protocol ratification.

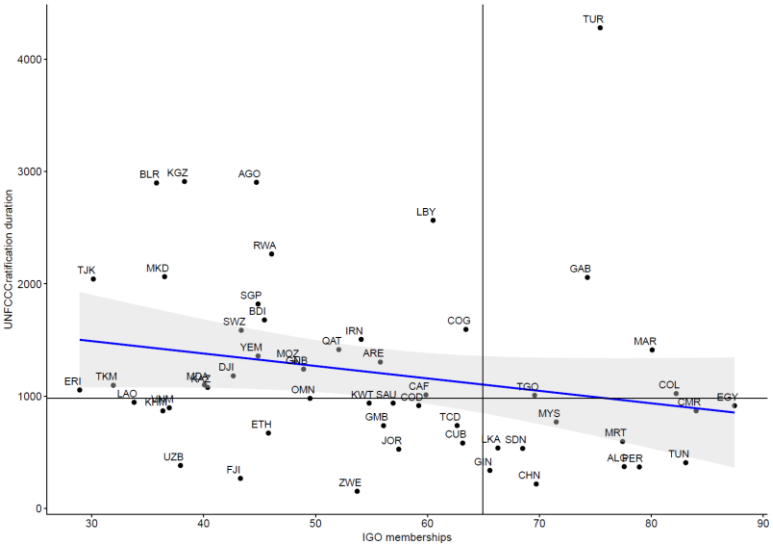
An alternative explanation, related to this finding, could be that a higher number of veto players delays the ratification process in democracies. This is in line with the finding that there is a significant effect of IGO involvement in countries with no specific veto points. However, the interaction between international political integration and horizontal accountability is not stable. The low variance of the veto-point indicators must also be considered.

Figure 7.5.2 International political integration and UNFCCC ratification delay in countries with above- and below-average levels of political rights (Global comparative analysis)

Above and average political rights



Below average levels of political rights



Notes: UNFCCC ratification duration = in days, IGO memberships = country average 1992-2006, bivariate linear regression of the relationship in blue, 95% confidence interval in grey, vertical line = average number of IGO memberships, horizontal line = average UNFCCC ratification duration.

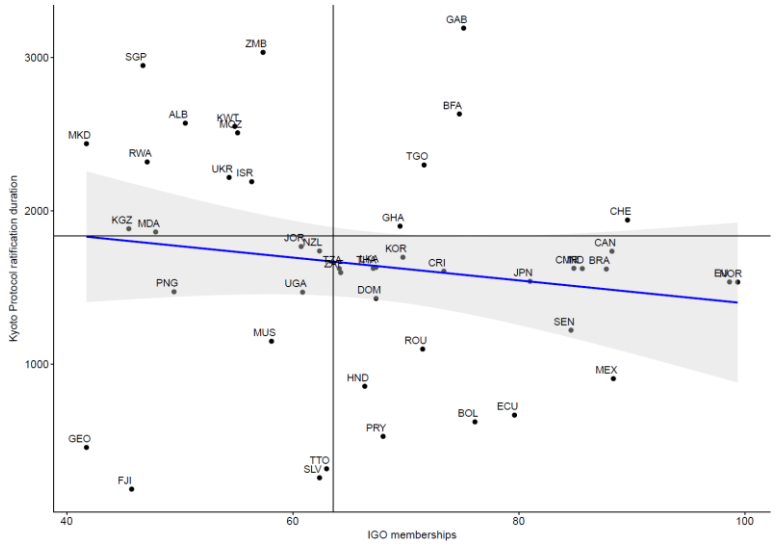
As explained above, international political integration contributes to UNFCCC ratification in countries with above-average and average levels of political rights. Figure 7.5.2 presents this relationship. Most countries with above-average and average political rights ratified the UNFCCC quickly if they were involved in many IGOs. Accordingly, most countries with below-average political rights and few IGO memberships took longer than the average to ratify the UNFCC. The ratification behaviour of countries with below-average IGO memberships and political rights varies considerably. These results suggest that countries with average levels of political rights ratify the UNFCCC in response to domestic demands but have little intention to implement it to enhance their reputations at the international level. Moreover, in accordance with the finding that IGO involvement contributes to UNFCCC ratification in autocracies, the positive effect of political rights on climate commitment becomes weaker in relation to political rights. In a simultaneous analysis, the interaction between IGO memberships with political rights as well as electoral democracy remained significant. It must be considered that electoral democracy correlates highly with political rights.

7.5.2 Kyoto Protocol ratification

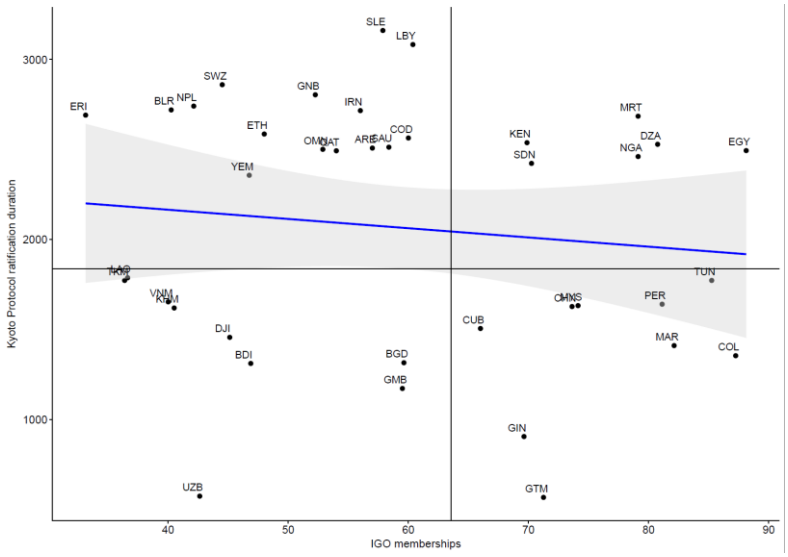
As expected, international political integration does not affect Kyoto Protocol ratification democracies and autocracies in different ways. There is no support for the hypothesis that political rights moderate the effect of international political integration ($H_{xdemocracy}2a$). In accordance with $H_{xdemocracy}2b$, civil rights matter for the influence of international political integration. IGO involvement contributes to Kyoto Protocol ratification in countries with above-average civil rights. In countries with below-average civil-rights values, international political integration can even delay Kyoto Protocol ratification.
Thus, the results support the theoretical expectation that governments that respect civil rights, including the rule of law, at the domestic level are more open to the positive influence of centrality in IGO networks on Kyoto Protocol ratification. First, acceptance of the rule of law at the domestic level makes it more likely that governments will join international agreements. Second, governments in countries with high civil-rights values are more likely to take environmental protection concerns into account (Leroy & van Tatenhove, 2000; Zahran et al., 2007, p. 41).

Figure 7.5.3 International political integration and Kyoto Protocol ratification in developing countries with above- and below-average civil rights

Above and average civil rights



Below average civil rights



Notes: Kyoto Protocol ratification duration = in days, IGO memberships = country average 1992-2006, bivariate linear regression of the relationship in blue, 95% confidence interval in grey, vertical line = average number of IGO memberships, horizontal line = average Kyoto Protocol ratification duration.

The higher positive effect of international political integration on Kyoto Protocol ratification in countries with high civil-rights values can be explained using the example of Bolivia. Bolivia is vulnerable to climate change (Hicks & Fabricant, 2016, p. 92). During the research period, it was characterised by above-average civil-rights values and centrality in IGO networks and it ratified the Kyoto Protocol relatively fast (see Figure 7.5.3). Democratic qualities, including civil rights, had improved considerably since the middle of the 1980s and they remained stable, at a relatively high level, during the research period. Moreover, V-Dem data indicate that Bolivia performed better on civil rights in 1992–2006 than on political rights or electoral and horizontal accountability. Since the middle of the 1980s, Bolivia's government had worked to enhance the country's reputation at the international level; for this reason, it participated actively in international cooperation (BTI, 2003). In the 1990s, Bolivia has continued to participate actively, at the international level, in environmental initiatives (Bojanic, 2001, p. 18). It ratified both the UNFCCC and the Kyoto Protocol quickly (see also Bojanic, 2001, p. 17). These developments are not independent of each other. They reflect the country's development strategy at the end of the last century. During the 1990s, the Bolivian government reduced government spending and inflation to tackle its economic crisis, in accordance with IMF loan conditions (Hicks & Fabricant, 2016). Bolivia privatised important economic sectors of its economy and implemented economic, social, and political reforms (Hicks & Fabricant, 2016, p. 89). It also improved civil rights, including property rights, to make its economy more attractive to international trade and investment. This approach reflects Bolivia's acceptance of the importance of civil rights for its development. Accordingly, Bolivia has also participated actively in international cooperation to enhance its international reputation. It is important to note that Bolivia joined international cooperative efforts that were associated with costs (BTI, 2003). With regard to the Kyoto Protocol in particular, it accepted market solutions to address global warming in the international climate change regime. Bolivia supported a mechanism in the Kyoto Protocol negotiations that aimed to use forests as emission sinks for developed countries. According to Bojanic (2001), Bolivia ratified the Kyoto Protocol because it regarded it as an opportunity to increase trade with developed countries and to receive financial aid and technology from developed countries. Thus, Bolivia accepted the rule of law, on the domestic and international level, to promote its own economic development.

The example of Bolivia, therefore, shows how acceptance of civil rights and international cooperation (as conditions for economic development) contributed to the relatively fast adoption of the Kyoto Protocol by the Bolivian government. This argument also applies to the more recent behaviour of the United States within the international climate change regime. The US not only questions climate cooperation but also the rule of the law on the domestic and international level.

By contrast, it cannot be argued that, during the research period, Bolivia ratified the Kyoto Protocol because of its acceptance of human rights. The implications of climate change affect human rights as well as other individual rights (Rajamani, 2010, pp. 293, 393). As Chapter 5 explains, the acceptance of human rights may contribute to a country's support of international cooperation to tackle climate change. The link between human rights and climate change was first identified, at the international level, only in 2005. In 2005, the Inuit argued before the Inter-American Commission on Human Rights that global warming caused by US emissions was undermining their human rights (Rajamani, 2010, p. 389). Rajamani (2010, p. 389) has described this as the beginning of climate change and human rights. However, human rights have influenced the further behaviour of Bolivia in the international climate change regime. Economic reforms during the 1990s led to the emergence of an environmental movement (Hicks & Fabricant, 2016, p. 89; Perreault, 2005). This movement criticised aspects of environmental governance, such as water privatisation, for lacking democratic accountability (Hicks & Fabricant, 2016, p. 89f.). For instance, water was framed by social movements as a human right (Hicks & Fabricant, 2016, p. 90). Simultaneously, social movements demanded nationalisation and indigenous rights (Hicks & Fabricant, 2016, p. 90). Academics and NGOs have adopted a human-rights perspective on global warming (Rajamani, 2010, p. 394). Indigenous groups have also argued within the UNFCCC that their vulnerability to global warming should be considered (Rajamani, 2010, p. 399). In 2007, Small-Island states emphasised the relationship between global warming and climate change (Rajamani, 2010, p. 399). In the UN climate negotiations, many developing countries adopted a human-rights perspective; these included Argentina, Bolivia, Chile, and Thailand (Rajamani, 2010, pp. 395f, 400). They emphasised that their countries must be economically able to mitigate climate change to ensure the survival and wealth of their citizens (Rajamani, 2010, pp. 395f.). In 2008, the General Assembly of the Organisation of American States accepted a resolution proposed by Argentina on the link between climate change and human rights (Rajamani, 2010, p. 400). Rajamani (2010, p. 400) has described how, during the climate change negotiations of 2008–2010, negotiators from Argentina, Bolivia, and Chile promoted a human-rights approach to global warming. In 2009, several Latin American countries, including Bolivia, Cuba, Ecuador, Nicaragua, and Venezuela, supported the link between climate protection and human rights (Rajamani, 2010, p. 402). Thus, the acceptance of human rights at the domestic level has contributed to Bolivia's support of climate protection at the international level. However, Bolivia only expressed support for the link between human rights and climate protection after ratifying the Kyoto Protocol. At the start of international negotiations on climate change, representatives of developing countries focused their right to pursue economic development (Rajamani, 2010, p. 394).

7.6 Conclusions

Is globalisation good or bad for climate commitment? This study set out to contribute to the academic literature by examining possible interaction-moderation effects of domestic political institutions. It applied a statistical analysis to test the hypotheses of three explanatory approaches to the joint effect of globalisation and domestic political institutions: the veto-player, political-corruption, and regime-type approaches. International economic integration has been shown to have no effect on UNFCCC or Kyoto Protocol ratification. However, international political integration does support UNFCCC and Kyoto Protocol ratification. In contrast to previous research, this chapter has shown that the effect is moderated by aspects of regime type. The data offer no support for the veto-player or political-corruption approaches. However, it does support the regime-type approach. Treaty design matters. The regime type moderates the effect of political globalisation on the UNFCCC, a soft international climate treaty. International political integration has been shown to have a positive effect on UNFCCC ratification in autocracies. There is no difference in the relationship between international political integration and Kyoto Protocol ratification between democracies and autocracies. However, civil rights are decisive for the relationship between international political integration and Kyoto Protocol ratification. Civil rights strengthen the positive effect of international political integration on Kyoto Protocol ratification. Countries that accept the rule of law at the domestic level ratified the Kyoto Protocol faster. Bolivia also persuaded other countries, including Mexico, Costa Rica, Colombia, and Uruguay, to support emission-reduction markets selling clean-development mechanisms (Bojanic, 2001, p. 21). Among various controls, regional commitment is important for UNFCCC and Kyoto Protocol ratification. The statistical analysis also suggests that countries that were more vulnerable to climate change ratified the former agreement later, and that monarchies entered into it later than military autocracies. Population density also contributes to Kyoto Protocol ratification.

References

Armingeon, Klaus, Christian Isler, David Weisstanner, and Laura Knöpfel. 2015. Supplement to the comparative political data set – Government composition 1960-2013. Bern: Institute of Political Science, University of Berne. http://www.cpds-data.org/index.php/data, Accessed 5 Jul 2016.

Bättig, Michèle B., and Bernauer, Thomas. 2009. National institutions and global public goods: Are democracies more cooperative in climate change policy? *International Organization* 63(2):281-308.

Bernauer, Thomas, Tobias Böhmelt, and Vally Koubi. 2013. National ENGOs registered in a country from Thomas, Bernauer, Tobias Böhmelt, and, Vally Koubi. 2013- The democracy – civil society paradox in global environmental governance. *Global Environmental Politics* 13(1):888-107. http://www.ib.ethz.ch/data/civilsoc.html. Accessed 7 May 2016.

Bojanic, Alan. 2001. Bolivia's participation in the UN Framework on Climate Change. London: Overseas development institute. https://www.odi.org/publications/3612-bolivias-participation-un-framework-climate-change. Accessed 7 May 2019.

Bookmann, Bernhard. no year. Domestic political determinants of treaty ratification: The acceptance of ILO conventions by industrialised countries. Mannheim: Centre for European Economic Research (ZEW).

Box-Steffensmeier, Janet M., and Bradford S. Jones. 2004. Event history modeling. A guide for social scientists. Cambridge et al.: Cambridge University Press.

Brambor, Thomas, William Roberts Clark, and Matt Golder. 2006. Understanding interaction models: Improving empirical analyses. *Political Analysis* 14(1):63–82.

BTI (Transformationindex Bertelsmann). 2003. Bolivia country report. https://www.bti-project.org/fileadmin/files/BTI/Downloads/Reports/2003/pdf/BTI_2003_Bolivia.pdf. Accessed 18 Jan 2019.

BTI (Transformationindex Bertelsmann). 2018. Sudan country report. https://www.bti-project.org/de/berichte/laenderberichte/detail/itc/SDN/. Accessed in 18 Jan 2019.

Cheibub, José Antonio, Jennifer Gandhi, and James Raymond Vreeland. 2009. Democracy and dictatorship revisited dataset 2009 (v.1). https://sites.google.com/site/joseantoniocheibub/¬datasets/democracy-and-dictatorship-revisited. Assessed 1 Aug 2017.

Cheibub, José Antonio, Jennifer Gandhi, and James Raymond Vreeland. 2010. Democracy and dictatorship revisited. *Public Choice* 143(1-2):67–101.

Coppedge, M., J. Gerring, S. Lindberg, S. Skaaning, S., Jan Teorell, David Altman, et al. 2017. VDem[country-year/country-date] dataset v7.1. Varieties of democracy (V-Dem) project. https://www.v-dem.net/en/data/data-version-7-1. Accessed 28 Nov 2018.

Cruz, Cesi, Philip Keefer, and Carlos Scartascini. 2016. Database of political institutions dataset, 2015 update (DPI2015). Updated version of Beck, Thorsten, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh. 2001. New tools in comparative political economy: The database of political institutions. *World Bank Economic Review* 15(1):165-176. Washington, D.C.: Inter-American Development Bank. http://www.iadb.org/en/research-and-data/publication-details,3169.html?pub_id=IDB-DB-121. Accessed 18 May 2016.

Esarey, Justin, and Jane Lawrence Sumner. 2018. Marginal effects in interaction models: Determining and controlling the false positive rate. *Comparative Political Studies* 51(9):1144–1176.

Fredriksson, Per G., and Noel Gaston. 2000. Ratification of the 1992 climate change convention: What determines legislative delay? *Public Choice* 104:345–368.

Freedom House. 2015. Freedom of the world. http://www.freedomhouse.org/report/freedom-world-aggregate-and-subcategory-scores. In *Quality of Government Standard Dataset, version Jan16*, eds. Jan Teorell, Stefan Dahlberg, Sören

Holmberg, Bo Rothstein, Anna Khomenko, and Jakob Svensson. Göteburg: The University of Gothenburg: The Quality of Government Institute. http://qog.pol.gu.se/data/datadownloads/qogstandarddata. Accessed 1 Jan 2016.

Gupta, Joyeeta. 2010. A history of international climate change policy. *Wiley Interdisciplinary Reviews: Climate Change* 1(5):636–653.

Hafner-Burton, Emilie M., and Kiyoteru Tsutsui. 2005. Human rights in a globalizing world: The paradox of empty promises. *American Journal of Sociology* 110(5):1373–1411.

Hathaway, Oona A. 2002. *Do human rights treaties make a difference?* Yale: Yale Law School (Faculty Scholarship Series, 839).

Hathaway, Oona A. 2007. Why do countries commit to human rights treaties? *Journal of Conflict Resolution* 51(4):588–621.

Hathaway, Oona A. 2008. Treaties' end: The past, present, and future of international lawmaking in the United States. *Yale Law Journal* 117:1236–1372.

Henisz, Witold J. 2002. The institutional environment for infrastructure investment. *Industrial and Corporate Change* 11(2):355–389.

Hicks, Kathryn, and Nicole Fabricant. 2016. The Bolivian climate justice movement. *Latin American perspectives* 43(4):87–104.

IASA (International Institute for Applied Systems Analysis) 2004. 13 IIASA-POP world regions, definition. http://webarchive.iiasa.ac.at/Research/POP/proj01/countries.html. Accessed 10 Sep 2016.

Jahn, Detlef. 2010. The veto player approach in macro-comparative politics: Concepts and measuruement. In *Reform processes and policy change*, eds. Thomas König, Marc Debus, and George Tsebelis, 43–68. New York, NY: Springer.

Jahn, Detlef. 2013. Einführung in die vergleichende Politikwissenschaft. 2. Auflage. Wiesbaden: Springer VS.

Leroy, Pieter, and Jan van Tatenhove. 2000. Political modernization theory and environmental politics. In *Environment and Global Modernity*, eds. Gert Spaargaren, Arthur P. J. Mol, and Frederick H. Buttel, 187–208. London et al.: Sage.

Lührmann, Anna, Kyle L. Marquardt, and Valeriya Mechkova 2017. Constraining governments: New indices of vertical, horizontal and diagonal accountability. Gothenburg; University of Gothenburg. The Varieties of Democracy Institute & Department of Political Science. (Working Paper 46).

Marshall, Monty G., Ted Robert Gurr, and Keith Jaggers. 2015. Polity IV project. Political regime characteristics and transitions, 1800-2015. Dataset users' manual. Center for Systemic Peace (Polity IV dataset version 2015). http://www.systemicpeace.org/inscrdata.html. Accessed 6 Jul 2016.

McMann, Kelly, Daniel Pemstein, Brigitte Seim, Jan Teorell, and Staffan I. Lindberg. 2016. Strategies of Validation: Assessing the Varieties of Democracy Corruption Data. Gothenburg: University of Gothenburg. The Varieties of Democracy Institute & Department of Political Science. (Working Paper 23).

Ministry of Foreign Affairs of the Netherlands. No year. Sudan. https://library.wur.nl/WebQuery/wurpubs/fulltext/464085. Assessed 15 Nov 2019.

Neumayer, Eric. 2002. Does trade openness promote multilateral environmental cooperation? *The World Economy* 25(6):815–832.

Pemstein, Daniel., Kyle L. Marquardt, Eitan Tzelgov, Yi-ting Wang, Joshua Krusell, and Farhard Miri. 2017. V-Dem measurement model: Latent variable analysis for cross-national and cross-temporal expert-coded data. Gothenburg: University of Gothenburg. Varieties of Democracy Institute. (Working Paper 21, 2nd ed.).

Perreault, Thomas. 2005. State restructruing and the scale politics of rural water governance in Bolivia. *Environment and Planning A: Economy and Space* 37:263–284.

Pevehouse, Jon C., Timothy Nordstrom, and Kevin Warnke. 2010. The COW-2 international organizations dataset version 2.3. Conflict management and peace sci-ence (21), S. 101-119. http://www.correlatesofwar.org/data-sets/IGOs. Accessed 7 May 2016.

Rajamani, Lavanya. 2010. The increasing currency and relevance of rights-based perspectives in the international negotiations on climate change. *Journal of Environmental Law* 22(3):391–429.

Simmons, Beth A. 2009a. Mobilizing for human rights. International law in domestic politics. Cambridge et al.: Cambridge University Press.

Simmons, Beth A. 2009b. Mobilizing for human rights. International law in domestic politics. Appendix 3.2 ratification rules. Cambridge et al.: Cambridge University Press. http://scholar.harvard.edu/bsimmons/mobilizing-for-human-rights. Accessed 7 Sep 2016.

Strange, David. 1994. Introduction to event history methods. In *The comparative political economy of the welfare State*, eds. Thomas Janoski, and Alexander M. Hicks, 245–253. Cambridge et al.: Cambridge University Press.

Swank, Duane. 2013. Comparative political parties dataset: Electoral, legislative, and government strength of political parties by ideological group in 21 capitalist democracies, 1950-2011. Electronic database, department of political science, Marquette University. http://www.marquette.edu/polisci/faculty_swank.shtml. Accessed 1 Aug 2016.

Teorell, Jan, Stefan Dahlberg, Sören Holmberg, Bo Rothstein, Anna Khomenko, and Richard Svensson. 2016. Quality of Government Standard Dataset, version Jan16: University of Gothenburg: The Quality of Government Institute. http://qog.pol.gu.se/data/datadownloads/qogstandarddata. Accessed 1 Jun 2016.

Therneau, Terry M., and Patricia M. Grambsch. 2000. Modeling survival data. Extending the cox model. New York: Springer Science & BUsiness Media, LLC.

The World Bank Group. 2016a. Trade (% of GDP). http://data.worldbank.org/indicator/NE.TRD.GNFS.ZS. Accessed 7 May 2016.

The World Bank Group. 2016b. Industry (including construction), value added (% of GDP). https://data.worldbank.org/indicator/NV.IND.TOTL.ZS. Accessed 17 Nov 2016.

The World Bank Group. 2016c. Fuel exports (% of merchandise exports). https://data.worldbank.org/indicator/TX.VAL.FUEL.ZS.UN. Accessed 17 Nov 2016.

The World Bank Group. 2016d. GDP per capita, PPP (constant 2011 international $). Last updated 22.07.2016. http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.KD. Accessed 6 Aug 2016.

The World Bank Group. 2017a. GDP growth (annual %). http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG. Accessed 15 Jun 2017.

The World Bank Group. 2017b. Population density (people per sq. km of land area). https://data.worldbank.org/indicator/EN.POP.DNST. Accessed 1 Jun 2017.

UNFCCC. no year a. Status of ratification of the Convention. https://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php. Accessed 6. Jan 2016.

UNFCCC. no year b. Status of ratification of the Kyoto Protocol. http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php. Accessed 6. Jan 2016.

United Nations [UN] comtrade. 2017. UN Comtrade Database. https://comtrade.un.org/. Accessed 18 Feb 2017.

United Nations Conference on Trade and Development. UNCTAT. 2015. Foreign direct investment: Inward and outward flows and stock, annual, 1980-2014 (World Investment Report 2015: Reforming International Investment Governance). http://unctad.org/en/Pages/statistics.aspx. Accessed 5 Aug 2016.

von Stein, Jana. 2008. The international law and politics of climate change. Ratification of the United Nations Framework Convention and the Kyoto Protocol. *Journal of Conflict Resolution* 52(2):243–268.

von Stein, Jana. 2013. The autocratic politics of international human rights agreement ratification. http://www.janavonstein.org/uploads/4/6/1/9/46194525/autocratic-hra-ratification.pdf. Accessed in 15 Nov 2019.

von Stein, Jana. no year. Data from The international law and politics of climate change. http://www.janavonstein.org/data.html. Accessed 9 Aug 2016.

Wenzelburger, Georg, Reimut Zohlnhöfer, and Pascal König. 2014. Weiterführende statistische Methoden für Politikwissenschaftler. Eine anwendungsbezogene Einführung mit Stata. Oldenbourg: De Gruyter.

Zahran, Sammy, Eunyi Kim, Xi Chen, and Mark Lubell. 2007. Ecological development and global climate change: A cross-national study of Kyoto Protocol Ratification. Society & Natural Resources 20(1):37–55.

8 Climate performance

Abstract

Is the globalisation good or bad for climate performance? This chapter contributes to the literature by examining whether the effects of different globalisation dimensions on climate performance depend on domestic political institutions. It applies a statistical analysis to test the hypotheses of three explanatory approaches to the joint influence of globalisation and domestic political institutions – the veto-player approach, the political-corruption approach, and in the analysis of developing countries, the regime-type approach. The results suggest that climate performance in the developed world depends on the climate outcomes of important trading partners. As expected, this effect is independent of domestic political institutions. No confirmation has been found that either the veto-player approach or the political-corruption approach can explain the relationship between policy diffusion via trading partners and climate performance. Among globalisation dimensions only trade and capital openness are associated with climate performance in developing countries. The statistical analysis of developing countries supports the political-corruption and regime-type approaches. Political corruption worsens the negative effect of international trade. The present study adds to previous research in showing that civil rights weaken the negative effect of international trade. Finally, capital openness contributes to climate performance in countries with below-average civil-rights values, but contributes to CO_2 emissions in countries with above-average civil-rights values. This supports the hypothesis presented in this study that civil rights undermine the scale effects of international trade climate protection, via attractiveness to foreign investment.

This chapter contributes to the globalisation/environment literature by examining the extent to which the effect of different globalisation dimensions on climate performance depend on domestic political institutions. Most quantitative studies of climate performance have applied TSCS (see Chapter 2). The term refers to the application of a regression analysis of repeated measures of spatial units (e.g., countries).[78] As TSCS simultaneously considers country differences and changes over time, it enables researchers to test the effects of variables that are assumed to be equal among countries and over time (Jahn, 2013, p. 398; Kittel & Winner, 2005, p. 289; Kittel, 2005, p. 100; Wolf, 2015, p. 109). In contrast to cross-sectional regression analyses, the analysis of repeated observations of countries is less affected by the problem of too many variables and too few cases (Jahn, 2013, p. 398; Lijphart, 1971, p. 685; Podestà, 2002, pp. 6f.). Chapter A8.1 in the annex examines the model assumptions of TSCS for the developed and developing-country sample in this study. Both datasets violate the assumptions of no autocorrelation, stationarity, and homogeneity of units. The application of methods to deal with these violations in a pooled time-series analysis would make it impossible to analyse country differences in climate performance. For this reason, a cross-sectional OLS regression is applied instead. Cross-country variations are of primary interest in this study. The OLS regression estimates the effect of levels of independent variables on levels of dependent variables. The following sections estimate OLS regression models, based on research-period averages of independent and dependent variables, to address long-term relationships between independent and dependent variables (e.g., Babones, 2014, pp. 180f.). The use of long-term-period averages of independent and dependent variables also increases the reliability of the indicators (You & Khagram, 2005, p. 141). Any cross-sectional regression analysis is vulnerable to omitted-variable bias (Plümper et al., 2005, p. 334). The following sections consider relevant control variables. As explained in Chapter 2, country differences in climate performance among developed countries and developing countries are examined separately (8.1 & 8.2). Section 8.3 discusses the statistical findings. The final section (8.4) summarises the results.

8.1 Developed countries

This chapter examines the research question in relation to developed countries. The first section explains the coding of the independent and dependent variables in the analysis of country averages and examines univariate distributions of the main independent and dependent variables (9.2.1). Second, the research question is analysed using an OLS regression of country averages from 1992 to 2006. This chapter investigates the additive effects of international integration, relative to domestic political institutions and control variables (9.2.2), as well as possible moderation effects (9.2.3).

[78] In contrast to panel analyses in survey research that studies many cases (N>1,000) at a few time points (t<5), TSCS refers to analyses of few cases (N = 15 to 30) (Podestà, 2002, p. 6; Wolf, 2015, pp. 109f.) over a long period of time (t > 10) (Beck, 2001, p. 274; Bohlken, 2011, p. 5; Wolf, 2015, p. 110 Footnote).

8.1.1 Univariate analysis

Before presenting the results, this section examines the univariate distributions of independent and dependent variables. As the previous section explains, this study has investigated long-term country differences, using country averages from 1992 to 2006. Tables 8.1.1–8.1.3 summarise the coding of variables in the analysis of climate performance in developed countries. Presidential veto power is not considered, as there is a lack of variance among developed countries (see Chapter 6).[79]

Table 8.1.1 Measurement of the dependent variable

Variable	Measurement	Data Sources
Climate performance	CO_2 emissions metric tons per capita levels divided by GDP per capita, PPP in constant 2011 US Dollars and standardised with the best-practice approach for developed Annex I countries. Higher values indicate a better climate performance.	World Bank (2016a)

Notes: Analysis units = country-averages from 1992-2006.

[79] Only Portugal and the United States had a president with veto power during the complete research period; France had one in 1996 and between 2003 and 2006. Finland had one until 2000.

Table 8.1.2 Measurement of the main independent variables

Variable	Measurement	Data Sources
Economic globalisation	a. Trade openness: Logged % of the sum of imports and exports of domestic GDP corrected for population size. b. Capital openness**:** % of stock of (FDI) inflows of GDP. c. Policy diffusion via economic interdependence: Spatial lag variable that measures the climate performance of a country's five most important trading partners based on the amount of exports and imports of commodities. Higher values indicate a better climate performance of a country's most important trading partners.	a. World Bank (2016b) b. UNCTAT (2015) c. UN COMTRADE (2017)
Political globalisation	a. IGO Memberships: Annual number of full country memberships in IGOs. Missing values and no state system members are coded as no membership. b. Centrality in IGO networks: Annual number of a country's indirect and direct IGO's ties to other countries in 1.000.	a. Pevehouse et al. (2010) b. von Stein (no year)
Government ideology	% of left, right, and logarithmised centre party seats in government cabinets.	Swank (2013)
Ideological heterogeneity among veto players	Left – right polarisation among partisan veto player within political institutions with veto player status in domestic policy. 0 – no left – right polarisation, 1 – left – right polarisation	Armingeon et al. (2015) in Teorell et al. (2016); Cruz et al. (2016), Henisz (2002), Jahn (2010)
Veto points	a. Government fragmentation: Logarithmised annual number of governmental parties. b. Bicameralism (domestic policy): Veto player status of the upper house of the legislative in domestic policy. 0 – no bicameralism, 1 bicameralism.	a. Cruz et al. (2016) b. Jahn (2010)
Forms of Political Corruption	a. Political corruption: Logarithmised Political Corruption Index b. Executive corruption: Logarithmised Executive Corruption Index c. Legislative corruption: Legislative corrupt activities d. Public sector corruption: Logarithmised Public Sector Corruption Index Higher values indicate higher values of political corruption.	a., b. & d. McMann et al. (2016) c. Coppedge et al. (2017) & Pemstein et al. (2017)

Notes: Analysis units = country-averages from 1992-2006. Exceptions: country averages of policy diffusion and IGO memberships from 1992-2005 and network centrality from 1992-2003. Ideological heterogeneity is measured by the sum of years of left – right polarisation from 1992-2006. Countries that have been more than half of the research period (seven years) a bicameral system are coded with 1 and if not with 0.[80]

[80] Countries with upper status of the second chamber of the legislative: Australia, Canada, France, Germany, Italy, Japan, Netherlands, Spain, Switzerland, United Status. Countries without upper status of the second chamber of the legislative: Austria, Belgium, Denmark, Finland, Greece, Ireland, New Zealand, Norway, Portugal, Sweden, United Kingdom. In fact, only the veto power of the Belgium upper house of the legislative has changed over time. Belgium is coded as having two legislative veto players by Jahn (2010) until 1993. I code Belgium as not having veto player status of the second chamber of the legislative.

Table 8.1.3 Measurement of the control variables

Variable	Measurement	Data Sources
Economic Development	Natural logarithm of GDP per capita in constant 2010 US$.	World Bank (2016e)
Economic growth	Logarithmised annual % growth rate of GDP at market prices based on constant local currency.	World Bank (2017a)
Industry group strength	a. % of the industry sector of GDP. b. Logarithmised fuel exports as % of merchandise exports.	a. World Bank (2016c) b. World Bank (2016d)
Corporatism	Corporatism index from Siaroff (1999)	Siaroff (1999)
ENGO strength	Logarithmised annual number of ENGOs in a country registered with the IUCN.	Bernauer et al. (2013)
Population density	Logarithmised population size divided by land area in m².	World Bank (2017b)
Population growth	Population growth. Higher values indicate higher population growth rates.	World Bank (2017c)
Urban population	Urban population as % of total population.	World Bank (2016f)
Climate change vulnerability	Climate change index: It indicates climate change risk exposure on a scale from 0 to 1. Higher values indicate greater climate change risk exposure.	Bättig & Bernauer (2009)
Electoral system	a. Plurality electoral system: 1 – plurality electoral system, 0 – no plurality electoral system. b. Mixed electoral system: 1 – mixed electoral system (plurality and PR), 0 – no mixed electoral system. Reference category: PR electoral system.	Cruz et al. (2016)
EU integration	EU country membership – 1, No EU country membership – 0	Own coding
Political parties in parliament	% of left, right, logarithmised centre, and left libertarian party seats in the lower chamber of the legislative	Swank (2013)

Notes: Analysis units = country-averages from 1992-2006. Exceptions: EU membership = I code countries with EU membership most of the years from 1992 to 2006 as EU members (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, and the United Kingdom), and other countries as non-EU members. Austria, Finland and Sweden have entered the EU in 1995 and are, therefore, treated as EU members. Climate change vulnerability = The Climate change index offers refers to the period from 1990-2005.

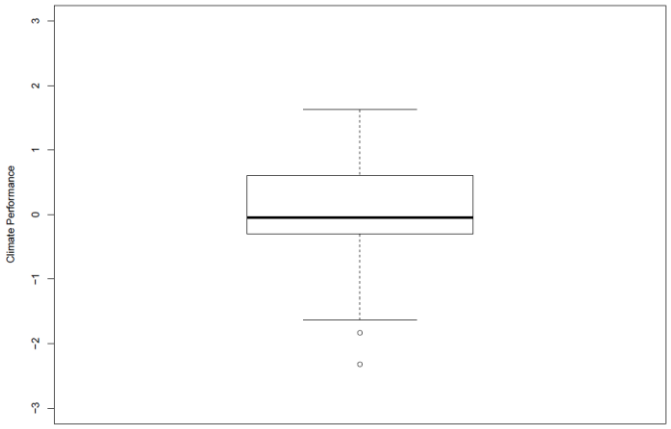
Climate-performance levels vary considerably among developed countries (see Table 8.1.4). Switzerland and two Scandinavian countries (Norway and Sweden) perform best, while the Anglo-Saxon countries (Australia, Canada, and the United States) share the lowest performance among developed countries. The first two are even univariate outliers (see Figure 8.1.1). The bad performance of these three countries is well known in comparative climate policy research (e.g., Christoff & Eckersely, 2011, p. 438; Hanusch, 2018, p. 75).

Table 8.1.4 Climate performance of developed countries

Switzerland	97.09
Norway	91.45
Sweden	86.58
France	82.71
Austria	76.57
Italy	76.22
Portugal	75.31
Spain	73.87
Denmark	68.88
Netherlands	66.02
New Zealand	63.01
Germany	62.99
Japan	62.07
United Kingdom	61.52
Ireland	60.98
Belgium	57.94
Greece	56.18
Finland	50.63
United States	30.66
Canada	26.59
Australia	16.65
Mean	
All countries (N=21)	64.00
Nordic countries	74.38
Central European countries (incl. CHE)	74.22
Anglo-Saxon countries (incl. JPN)	45.93
Southern European countries	68.45
Median	63.01
Standard deviation across countries	20.39
Standard deviation over time	6.44

Notes: Analysis units = country averages from 1992-2006.

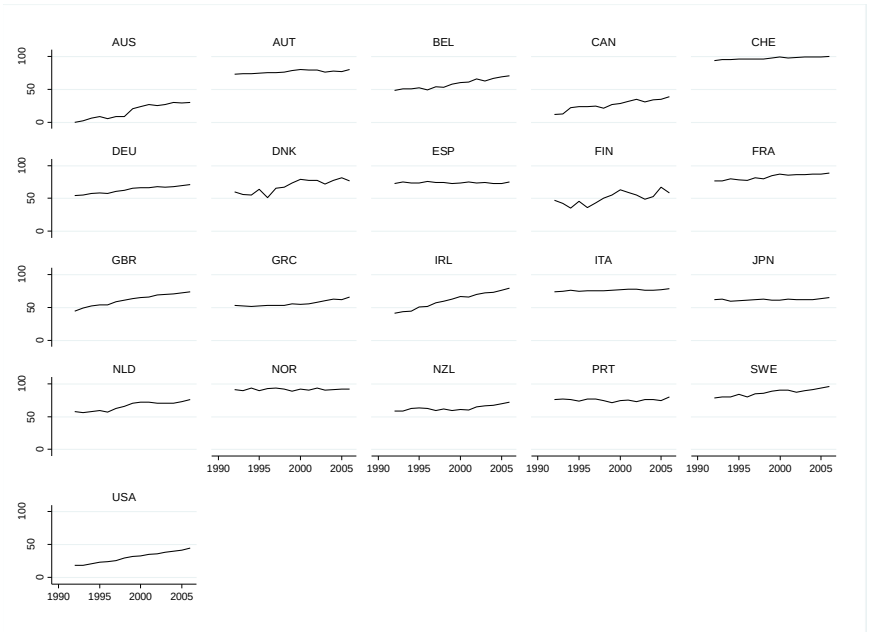
Figure 8.1.1 Variation in climate performance in developed countries



Notes: Analysis units = country averages from 1992-2006. The boxplot displays z-scores. N=21.

Several countries have improved their climate performance over time (see Figure 8.1.2). In Germany, emissions reductions stem from reunification; in the United Kingdom, they reflect the restructuring of the national economy. Overall, CO_2 emissions vary more between countries (standard deviation=20.39) than over time (1992–2006) (standard deviation=6.44). Accordingly, Christoff and Eckersley (2011, p. 431) have concluded that 'there has been no concerted or effective collective state response to the threat of global warming.' The question is therefore: What causes these persistent country differences? As Chapter 7 has described, the main independent variables also vary more across countries than over time.

Figure 8.1.2 Development of climate performance in developed countries, 1992–2006



Notes: Analysis units = country-years from 1992-2006.

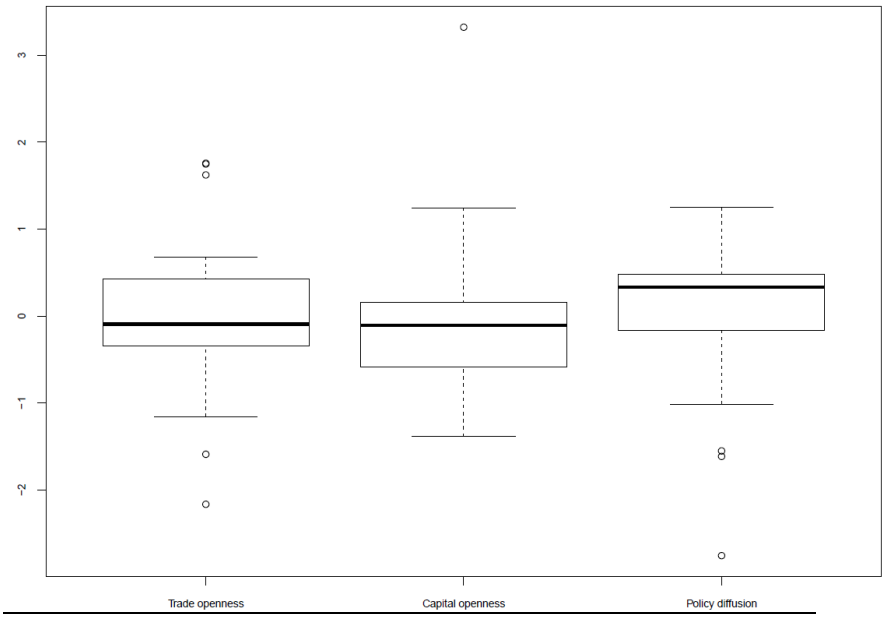
Table A8.2.1 in the annex presents univariate statistics of independent and control variables. As in Chapter 7, positively skewed variables have been logarithmised.[81] The annex (A8.2.4) tests whether there are problems with non-normally distributed residuals in the final regression model.

Compared to the other dimensions of economic globalisation, developed countries vary less in trade openness (see Figure 8.1.3). Moreover, a considerable part of the variance in international trade stems from outliers. Small EU member states – namely, Belgium and the Netherlands – are highly integrated in the international economy. Japan and the US share comparatively low levels of exports and imports as percentage of GDP. Capital openness and policy diffusion via trading partners vary more among developed countries. In relation to foreign direct investment, Ireland is a univariate outlier. Most countries share major trading partners with an average climate performance

[81] This includes trade openness, political corruption and executive corruption, ENGO strength, GDP per capita, GDP growth, centre-party seats as a percentage of total cabinet seats, centre-party seats in parliament, and fuel exports as a percentage of GDP per capita. Capital openness is not logarithmised, as it contributes only to negative skewness.

on the upper half of the scale. The boxplot shows that the univariate outliers Australia, Japan, and New Zealand mainly trade with states with relatively high CO_2 emissions. It is relevant to study whether this also explains their below-average climate performance.

Figure 8.1.3 Variation in international economic integration among developed countries



	Mean	Median	Std.dev.	Minimum	Maximum
Trade openness	-.02	-.04	.17	-.38	.27
Capital openness	27.12	25.12	18.73	1.19	89.32
Policy diffusion	57.64	61.75	12.36	23.58	73.08

Notes: Analysis units = country averages from 1992-2006. The boxplots display z-scores. N=21. Std.dev. = Standard deviation.

Countries with above-average levels of policy diffusion perform above the average in climate protection as well (see Table 8.1.5). This is in line with the hypothesis that climate performance in developed countries depends on the climate outcomes of important trading partners.

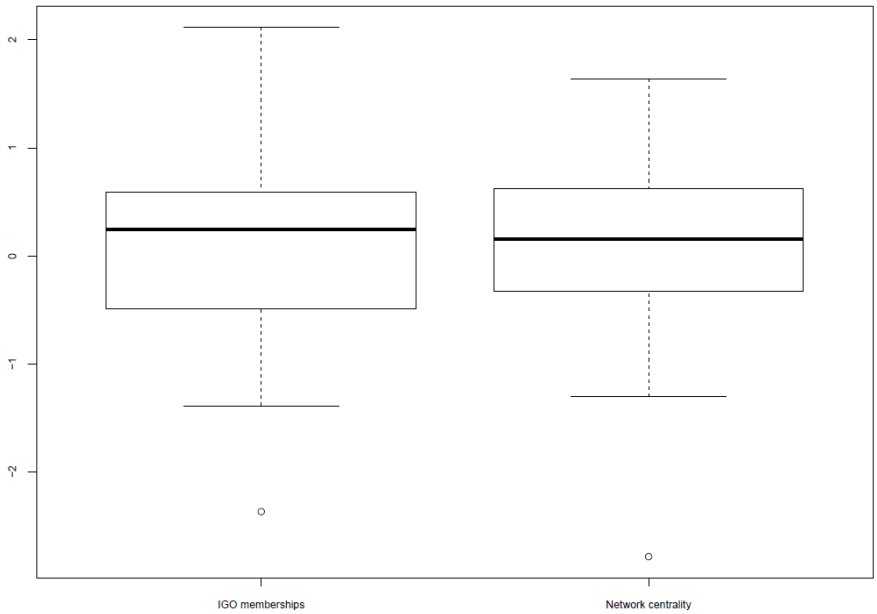
Developed countries also differ with regard to their international political integration – measured by state memberships in IGOs and state centrality in the IGO network (see Figure 8.1.4). More than 50% of the country sample share above-average levels of IGO involvement. New Zealand has relatively little involvement with IGOs.

Table 8.1.5 Mean comparison of the climate performance of developed countries

	Mean Climate performance	N
Above average trade openness	66.51	10
Above average capital openness	64.04	7
Above average policy diffusion	72.95	15
Above average IGO memberships	70.80	11
Above average network centrality	68.24	12
Bicameralism	59.49	10
Government fragmentation	71.58	11
Left party strength in government	69.25	12
Right party strength in government	61.88	10
Centre party strength in government	65.86	12
Left/right polarisation above average sum of years	66.60	11
Above average left party strength in parliament	66.64	13
Above average right party strength in parliament	59.47	11
Above average centre party strength in parliament (ln)	65.57	13
Above average left libertarian party strength in parliament	72.12	10
Above average public sector corruption	63.55	11
Above average legislative corruption	67.12	10
Above average executive corruption	64.74	9

Notes: Analysis units = country averages from 1992-2006, N=21.

Figure 8.1.4 Variation in international political integration among developed countries



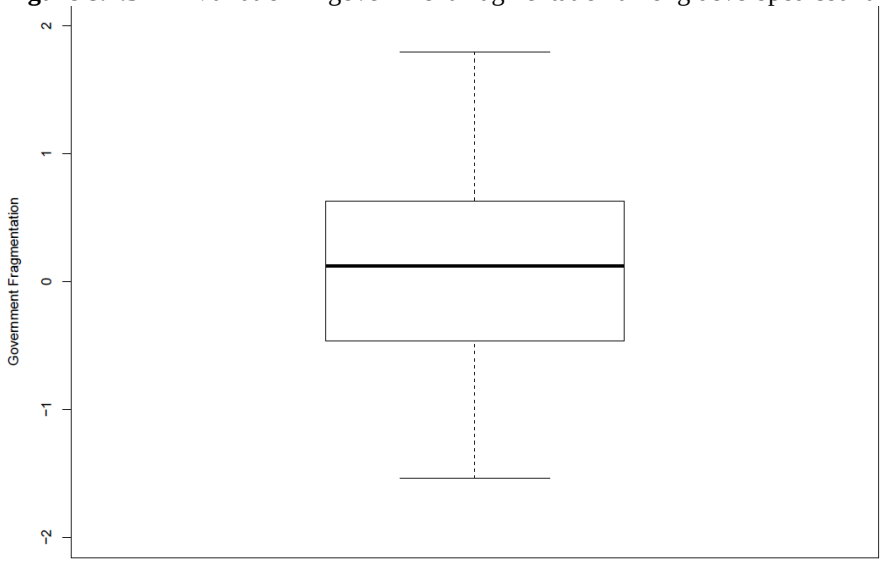
	Mean	Median	Std.dev.	Minimum	Maximum
IGO memberships	94.35	97.86	14.20	60.71	124.42
Network centrality	6.57	6.64	.43	5.37	7.27

Notes: Analysis units = country averages from 1992-2006. The boxplots display z-scores. N=21. Std.dev. = Standard deviation.

In accordance with the hypotheses in this study, there is little variation in CO_2 emissions among countries with above-average left, centre, and right-wing party strength in government or parliament, as well as left/right polarisation. Countries with an above-average number of government parties, PR electoral rules, or left-libertarian party strength in parliament perform well in climate protection. Figure 8.1.5 shows that government fragmentation varies considerably among developed countries.

There is little variation among developed countries with regard to public sector corruption (Figure 8.1.6). Most countries share low levels of executive and public sector corruption. However, there are several univariate outliers. Greece has the highest levels of executive and public sector corruption. Austria, Italy, and Portugal are also outliers with regard to corrupt bureaucrats. By contrast, legislative corruption varies considerably among developed countries.

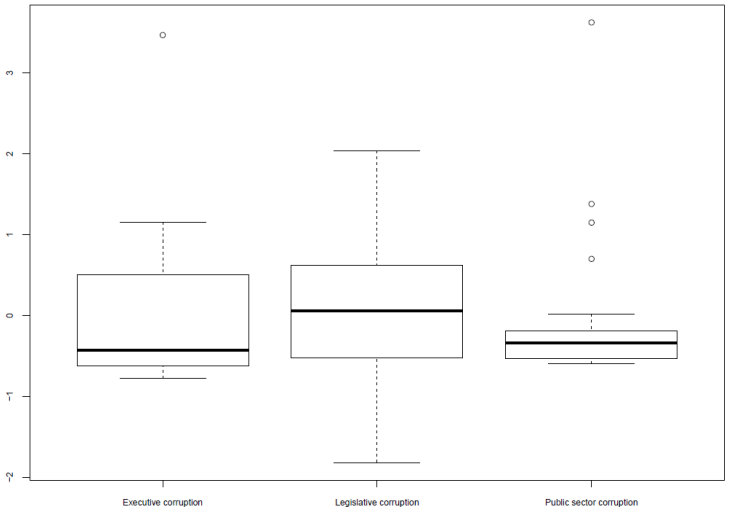
Figure 8.1.5 Variation in government fragmentation among developed countries



	Mean	Median	Std.dev.	Minimum	Maximum
Government fragmentation	.73	.79	.47	.00	1.58

Notes: Analysis units = country averages from 1992-2006, N=21. The boxplots displays z-scores. Std.dev. = Standard deviation.

Figure 8.1.6 Variation in political corruption among developed countries



	Mean	Median	Std.dev.	Minimum	Maximum
Executive corruption	.07	.04	.08	.01	.34
Legislative corruption	-1.63	-1.57	.99	-3.42	.39
Public sector corruption	.08	.04	.12	.01	.52

Notes: Analysis units = country averages from 1992-2006, N=21. The boxplots display z-scores. Std.dev. = Standard deviation.

8.1.2 International integration and climate performance

This section examines the additive effects of international integration on climate performance. The sample size (n=21) poses three challenges, given fewer degrees of freedom. First, few independent variables can be included simultaneously in the same regression model. Second, parameters and significance values become more vulnerable to the influence of outliers, i.e. cases that are not explained by the regression model (Urban & Mayerl, 2011, pp. 185f., 191f.). Third, a small number of degrees of freedom, in combination with multicollinearity, i.e. linear relationships between independent variables within a regression model (Urban & Mayerl, 2011, pp. 225ff.), can contribute to unstable regression results (Hildebrandt, 2015, p. 90). Here, this has three implications for the cross-sectional regression models. First, a step-wise regression is used to consider sample size. This makes it possible to take into account the complexity of models during the interpretation (Hildebrandt, 2015, p. 90). There is no agreement in the literature on the number of variables that can be included in a regression model, based on the number of cases (Jahn, 2013, p. 378). Roller (2005) includes in her analysis of established Western democracies only two independent variables in one model. Following Jahn (2013, p. 378), the number of independent variables should not be higher than 1/3N-1 (constant) (N= number of countries). In accordance with a stricter rule, the present study tests the effect of globalisation dimensions in pairwise control with other variables. Pairwise control of interaction effects implies that these models include main terms, the interaction term, and one control variable consisting of four independent variables. Following Jahn's (2013) recommendation, there need to be at least 15 cases. The models in this study are also estimated without outliers. The first step in the stepwise regression analysis is to estimate bivariate correlations (Babones, 2014, p. 130; Hildebrandt, 2015). Next, the stability of the effects are examined, in pairwise comparison to another independent variable. The third step tests interactions between domestic political institutions and international integration in separate models. Finally, the stability of interaction effects (in pairwise comparison to one other independent variable) is examined.

Bivariate and multivariate regression models are analysed with and without multivariate outliers (Urban & Mayerl, 2011, p. 191f.). Outliers, i.e. countries characterised by an absolute distance of more than two standard deviations between their observed values and their predicted values (based on the regression model) are excluded (Urban & Mayerl, 2011, p. 185). Next, influential observations based on additional statistics (Cook's D, Standardised DfBeta's, and Leverage) are dropped from the analysis. Because of the small sample size, countries with a Leverage value of 3k/N or higher are excluded (Urban & Mayerl, 2011, p. 188). The letter k refers to the number of independent variables included in the regression model. N refers to the number of cases. Observations with an absolute value of DFBETA and/ or Cook's D equal to or higher than 1 are dropped from the analysis (Urban & Mayerl, 2011, p. 189). If additional observations are identified as outliers (2 standard deviations) after the

exclusion of outliers and influential cases during the first two steps, they are also excluded from the analysis. The last model is reported.

Correlations among independent variables are then examined to check for possible problems with multicollinearity (see Chapter A8.2.2 in the annex). Several correlations are higher than .8 or even .9 and cannot be tested simultaneously. This includes left/right/centre strength in government with left/right/centre strength in parliament, executive and legislative corruption and IGO memberships and state centrality in IGO networks.

Tables 8.1.6–8.1.8 present bivariate correlations among the independent and dependent variables. Regarding controls, economic development is positively associated with climate performance when outliers are excluded from the analysis. $H_{cont}1b$ has argued that there is no clear relationship between economic development and climate performance in high-income countries. The negative effect of industry-sector size ($H_{cont}2$) becomes significant when several outliers are excluded from the analysis. In accordance with hypothesis $H_{cont}3$, fuel exports contribute to CO_2 emissions when bivariate outliers – Norway, Ireland, and the United States – are excluded from the analysis.

Table 8.1.6 Bivariate correlations between economic and political globalisation and climate performance in developed countries

Independent variable	N=21	Without outliers	Outliers
Economic globalisation			
Trade openness (lg)	.265	.316	AUS, CAN, USA, BEL, IRL
Capital openness	-.061	-.082	AUS, CAN, USA, CHE, IRL
Policy diffusion	.506**	.635***	JPN
Political globalisation			
IGO memberships	.347	.355	FRA, NZL
State centrality in IGO networks	.341	.433*	NZL

Notes: Analysis units = country averages from 1992-2006. The table displays Pearson's r.

Table 8.1.7 Bivariate correlations between domestic political institutions and climate performance in developed countries

Independent variable	N=21	Without outliers	Outliers
Veto players			
Left party strength in government	.426*	.460*	AUS, CHE, SWE
Right party strength in government	-.275	-.216	CAN, AUS, USA, CHE, JPN, IRL
Centre party strength in government (ln)	-.050	-.250	AUS
Left party strength in parliament	.416*	.182	AUS, CHE, USA, CAN
Right party strength in parliament	-.189	-.067	AUS, CAN, USA, CHE, PRT, IRL
Centre party strength in parliament (ln)	-.023	-.406*	AUS, GRC
Left libertarian party strength in parliament	.453**	.301	AUS, NOR
Ideological heterogeneity among veto players	.141	.360	AUS
Bicameralism	-.216	.248	AUS, CAN, USA
Government fragmentation (ln)	.409*	.419*	AUS
Political corruption			
Executive corruption (ln)	-.070	-.041	AUS, CAN, USA, GRC
Legislative corruption	.192	.327	AUS, CAN, USA, ITA, CHE
Public sector corruption	.058	.788***	AUS, CAN, USA, GRC, CHE, NOR, SWE, FRA, FIN
Political corruption (ln)	-.103	-.268	AUS, CAN, USA, ITA

Notes: Analysis units = country averages from 1992-2006. The table displays Pearson's r.

Table 8.1.8 Bivariate correlations between control variables and climate performance in developed countries

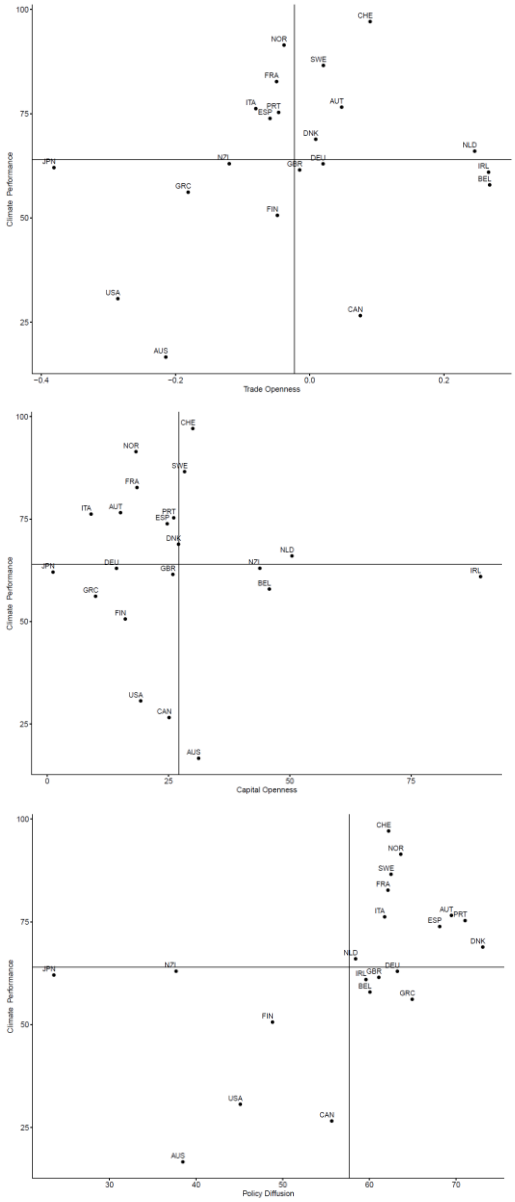
Independent variable	N=21	Without outliers	Outliers
Control variables			
Economic development (ln)	.200	.422*	AUS, CAN, USA, NOR
Economic growth (ln)	-.350	-.139	AUS, CAN, USA, IRL
Industry sector size	.244	-.463*	AUS, CAN, USA, CHE, GRC, NOR, SWE
Fuel exports (ln)	-.228	-.676***	NOR, IRL, USA
Corporatism	.496**	.399	AUS, NOR
ENGO strength (ln)	-.395*	-.070	IRL, USA, AUS, CAN
Population density (ln)	.491**	.191	NOR, SWE, AUS, CAN, USA, CHE
Population growth	-.463**	-.369	IRL, NZL, AUS
Urban population	-.310	.034	AUS, CAN, USA, CHE, PRT, BEL
Climate change vulnerability	.103	.091	AUS, CAN, USA, CHE, NOR
EU membership	.307	.691***	CHE, NOR

Notes: Analysis units = country averages from 1992-2006. The table displays Pearson's r.

There is no significant relationship between economic growth and global air-pollution levels. There is no stable effect of ENGO strength or demographic factors (population growth, population density, and urban population) or climate vulnerability on climate performance. The positive effect of corporatism becomes insignificant when Australia and Norway are excluded from the analysis. EU members show a higher climate performance ($H_{cont}11$). The relationship becomes stronger and statistically significant when outliers – Norway, Portugal, and Switzerland – are excluded from the analysis. As expected, ($H_{cont}14$), plurality electoral systems perform less well than PR systems in climate performance (see Table A8.2.2 in the annex).

As expected ($H_{Int}1.3.1$ & $H_{Int}2.3.1$), there is no support for the hypothesis that economic openness, measured by trade or capital openness, influences climate performance in developed countries. The visual inspection of the scatter plots underlines these findings (see Figure 8.1.7). These results remain stable in pairwise comparison to other variables (see Tables A8.2.3–A8.2.6 in the annex). Trade openness contributes significantly to climate performance only when economic growth is controlled with and without outliers. By contrast, there is, as expected ($H_{Int}3.3.1$), a strong significant effect of policy diffusion on climate performance. Among various explanatory factors, it has the strongest effect on the dependent variable. Countries that trade with countries with low CO_2 emissions also perform well. Australia, Canada, and the United States have high global air-pollution levels and share important trading partners with low levels of climate performance (see Figure 8.1.7). By contrast, the trading partners of Norway and Sweden also perform well. The relationship becomes stronger when the bivariate outlier – Japan – is excluded from the analysis. This finding remains the same in pairwise comparison to control variables with and without outliers/influential cases (see Tables A8.2.7–A8.2.8).

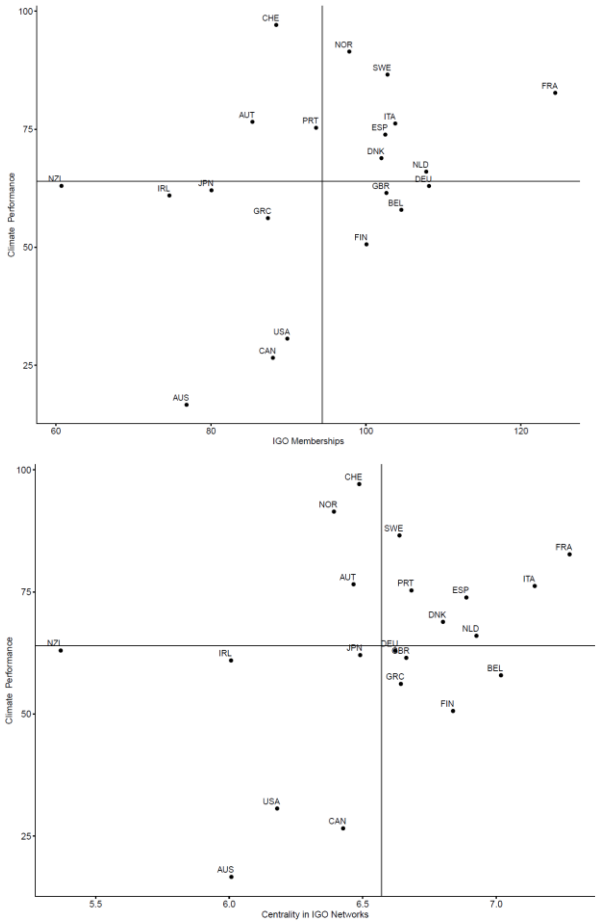
Figure 8.1.7 International economic integration and climate performance in developed countries



Notes: Analysis units = country averages from 1992-2006, N=21. Vertical and horizontal lines = average values of international economic integration and climate performance.

The effect of policy diffusion became insignificant when I controlled outliers. It turned significant again when outliers—Canada, Japan and Switzerland—were removed from the analysis (see Table A8.2.14 in the annex). In the bivariate analysis, there is no significant effect of IGO memberships or network centrality on climate performance ($H_{Int}4.3$). In pairwise comparison to other independent variables, the effect stays positive and becomes significant in some models (see Figure 8.1.8 & Table A8.2.9–A8.2.11 in the annex). The positive effect of state centrality in IGO networks becomes significant if New Zealand (bivariate outlier) is excluded from the analysis. It is insignificant in pairwise comparison to most other independent variables with and without outliers/influential cases.

Figure 8.1.8 International political integration and climate performance in developed countries



Notes: Analysis units = country averages from 1992-2006, N=21. Vertical and horizontal lines = average values of international political integration and climate performance.

With regard to the policy preferences of veto players, the ideological heterogeneity of veto players in the left/right dimensions does not help to explain climate performance ($H_{Veto}1.3.1$, $H_{Veto}2.3.1$, $H_{Veto}3.3.1$, & $H_{Veto}4.3.1$).[82] In contrast to the hypotheses, government ideology affects climate outcomes. With regard to governmental ideology, the bivariate analysis indicates that left-wing parties in government contribute to climate performance. There is no significant effect of right-wing party strength. While centre government ideology does not matter to CO_2 emissions, centre-party strength in parliament undermines climate performance when Australia and Greece are excluded from the analysis. There are no significant effects of left-wing or right-wing party strength in parliament with or without outliers/influential cases. A significant positive effect of left-libertarian parties in parliament becomes insignificant when outliers are considered. Government fragmentation contributes to climate performance. There is no significant relationship between bicameralism and CO_2 emissions levels. There is no support for the hypothesis that political corruption or its dimensions matter to climate outcomes. Significant public sector corruption only contributes to climate performance when nine outliers are excluded from the analysis.

To conclude, among globalisation dimensions, only policy diffusion via trading partners influences climate performance in the developed world ($H_{Int}3.3.1$). Government fragmentation and left-wing government ideology are associated with better climate performance. Political-corruption dimensions have no independent effect on CO_2 emissions in rich countries. Policy diffusion via trading partners is just as important for climate performance as EU membership and fuel exports.

8.1.3 Joint influence of international integration and domestic political institutions

This section examines the joint influence of globalisation and domestic political institutions on climate performance in developed countries. As in the analysis of climate commitment, marginal-effects plots are examined. Constituent terms of interaction effects are mean-centred. All models are estimated with and without outliers/influential cases and with and without pairwise control of other independent variables.

[82] The same result is obtained when I use the logarithmised *jahn2* index from Jahn (2010): r=.170, without outliers (AUS, CAN, CHE, GBR, GRC, USA): r=-.169.

The previous section has shown that there is no independent effect of **trade and capital openness** on climate performance. There is likewise no support for the hypothesis that their effect depends on government ideology or on the ideological heterogeneity of veto players. When outliers and influential cases are excluded, there is a significant positive effect of trade openness, which becomes higher in relation to right-wing-party strength in government. This joint relationship, however, becomes insignificant in several models that include pairwise independent variables. There is no support for the hypothesis that specific veto points – government fragmentation or bicameralism – moderate the effect of trade or capital openness. A significant interaction between the number of government parties and trade openness (in the analysis without outliers/influential cases) is not stable when controls are considered. Executive, legislative, and public sector corruption do not moderate the effect of trade or capital openness.

The previous section has shown that a country's CO_2 emissions depend on the climate performance of its main trading partners. In accordance with theoretical expectations, there is no support for the hypothesis that left/right polarisation of veto players or government ideology in the left/right dimension moderates the effect of **policy diffusion**. When urban population is controlled for, with and without outliers, the effect of policy diffusion becomes stronger when the share of left-wing party seats in government increases. This interaction effect is not significant in all jack-knife analysis models, when countries are removed from the analysis in separate models. This also applies to jack-knife analyses that control for urban-population size. The marginal-effects plot indicates that the positive effect of policy diffusion becomes weaker in relation to right-wing-party strength in government. This interaction effect becomes insignificant when population density is controlled. Moreover, the direction is unstable when outliers and influential cases are excluded.

The statistical results indicate that there is a significant effect of policy diffusion only in bicameral systems. This finding becomes insignificant in the model without outliers and influential cases, which controls for left-wing-party strength in parliament. The statistical data suggest that the lower the government fragmentation, the stronger the positive effect of policy diffusion. The more below-average the number of government parties, the stronger the positive effect of policy diffusion. This effect is not significant at high values of government fragmentation. The effect is stable and significant in jack-knife analyses when one country is removed from the analysis. It is not stable in models that consider controls. In some models (compared to controls and with or without outliers and influential cases), it is only significant at average values of government fragmentation. In the analysis that controls for left-wing-party strength in parliament and the exclusion of outliers, the effect is only significant when the number of government parties is a higher value.

There is no support for the claim that executive, legislative, or public sector corruption moderate the effect of policy diffusion in developed countries. The effect of policy diffusion becomes stronger with public sector corruption. However, this interaction effect becomes insignificant in pairwise comparison to some controls. The lower the level of executive corruption, the stronger the positive effect of policy diffusion. The direction of this effect is not stable when independent variables are controlled or outliers are excluded. In some models, the positive effect of policy diffusion becomes stronger with executive corruption. In a jack-knife analysis the direction turns again. The same results are obtained when legislative corruption is used in place of executive corruption.

There is no significant interaction between **international political integration**, measured by IGO memberships or centrality in IGO networks, and executive corruption. In the analysis without outliers, lower the level of executive corruption, the stronger the significant positive effect of IGO memberships. This result becomes insignificant in pairwise comparison to controls. The joint effect of executive corruption and network centrality is insignificant in most models that control for other independent variables/and or remove outliers and influential cases. There are no stable significant interactions between IGO membership or network centrality and public sector corruption. When outliers and influential cases are excluded, there is a significant positive effect of IGO memberships in countries with below-average values of public sector corruption, which grows stronger as public sector corruption is reduced. It becomes insignificant in pairwise comparison to several controls. The data analysis shows no joint effect of IGO memberships and legislative corruption. A significant interaction with network centrality becomes insignificant in pairwise comparison to some independent variables, but significant when outliers and influential cases are removed from the analysis. Finally, it becomes insignificant in the analysis without Australia.

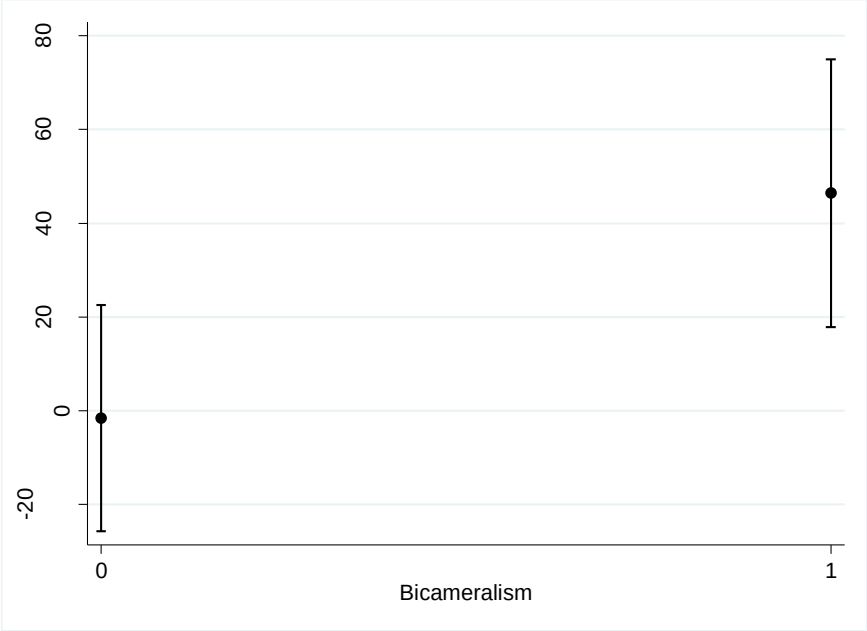
As expected, the ideological heterogeneity of veto players in the left/right dimension does not moderate the effect of IGO involvement. A significant interaction between network centrality and left/right polarisation in pairwise control of independent variables becomes insignificant in several models without outliers. There is no support for the hypothesis that left-wing or right-wing government ideology influences the relationship between state IGO memberships or network centrality and climate performance in developed countries. An joint effect between right-wing government ideology and network centrality is significant in comparison to a few other independent variables when outliers and influential cases are controlled.

The statistical analysis initially supports the finding that international political integration, captured by IGO membership or state centrality in IGO networks, contributes to climate performance when government fragmentation is below average. The lower the number of government parties, the stronger the positive effect of international

political integration. Most countries with a higher number of government parties have higher levels of political integration and climate performance. Australia, Canada, and the US have below-average levels of government fragmentation and a low-level climate performance. However, this moderation effect becomes insignificant when country size is controlled.

There is a positive effect of IGO membership in countries with bicameralism. It becomes insignificant in pairwise comparison to some independent variables. In the analysis without outliers, it is insignificant in the model that includes EU membership. By contrast, the positive effect of state centrality in countries with bicameralism remains stable in comparison to other independent variables and/or when outliers and influential cases are excluded from the analysis (see Figure 8.1.9). It remains significant and stable in jack-knife analyses. There is no significant effect of state centrality in countries without bicameralism. It is only significant in the model with left/right polarisation. The inclusion of the interaction term in the multivariate model with network centrality and bicameralism improves the explanatory model significantly. R^2 increases from .193 (R^2 adjusted = .104) to .437 (R^2 adjusted .337) (F-test on change in R^2 = **).

Figure 8.1.9 State centrality in IGO networks, bicameralism and climate performance in developed countries



Notes: Marginal effect plot, 95% confidence interval. Analysis units = country averages from 1992-2006, N=21.

This study has tested the assumptions of no multicollinearity, homoscedasticity, and normal distribution of residuals of OLS regression of the regression model with the interaction effect between network centrality and bicameralism (see Chapter A8.2.4 in the annex). The regression model does not violate the assumptions related to homoscedasticity of errors or multicollinearity. Residuals are normally distributed when the two outliers (Switzerland, New Zealand) are excluded from the analysis. The results remain stable. As previously explained, the positive effect of network centrality in bicameral systems remains significant in jack-knife analyses (see Figure A8.2.6). It becomes insignificant when country size is controlled. It turns significant again when outliers are removed (see Figure A8.2.7 in the annex). The results remain stable when climate conditions are considered (see Chapter A8.2.5 in the annex). Network centrality also contributes to climate performance in bicameral developed countries in the analysis of country averages during the two sub-periods (1992–1999 and 2000–2006).

Table 8.1.9 International political integration, bicameralism, and climate performance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Network centrality	-7.990 *-.169* (12.39)	-1.755 *-.037* (11.85)	-4.659 *-.098* (12.61)	-3.971 *-.084* (11.61)	-2.694 *-.057* (11.552)	-5.237 *-.111* (12.97)	-5.965 *-.126* (12.89)
Bicameral-ism	-7.366 *-.185* (8.159)	-11.67 *-.293* (7.967)	-13.04 *-.327* (7.686)	-6.337 *-.159* (9.043)	-7.976 *-.200* (8.581)	-9.454 *-.237* (8.488)	-9.426 *-.237* (8.163)
Network centrality x Bicameral-ism	44.70** *.607*** (17.67)	47.58** *.646*** (18.61)	50.78** *.689*** (18.57)	45.66** *.620*** (17.80)	44.830** *.608*** (18.144)	49.80** *.676*** (18.27)	52.25** *.709*** (18.77)
Policy diffu-sion	.478 *.290* (.387)						
Trade open-ness (lg)		3.180 *.026* (25.25)					
Capital Openness			-.143 *-.131* (.226)				
Left govern-ment ideol-ogy				.231 *.244* (.216)			
Left party strength in parliament					.259 *.201* (.281)		
Right gov-ernment ide-ology						-.131 *-.144* (.207)	
Right party strength in parliament							-.213 *-.168* (.278)
Constant	38.35 (24.49)	67.93*** (5.240)	72.26*** (8.502)	56.90*** (11.55)	56.386 (13.576)	71.69*** (7.790)	75.21*** (10.70)
R^2	.486	.437	.450	.474	.465	.450	.457
Adjusted R^2	.357	.296	.313	.342	.331	.313	.321
N	21	21	21	21	21	21	21

Notes: Analysis units = country averages from 1992-2006. The table displays unstandardised and standardised regression coefficients (in italics), and standard errors (in parentheses), * $p < .1$, ** $p < .05$, *** $p < .01$.

Table 8.1.9 International political integration, bicameralism, and climate performance (continuation)

	(8)	(9)	(10)	(11)	(12)	(13)
Network centrality	-4.015 *-.085* (12.50)	-3.418 *-.072* (12.36)	-.210 *-.004* (10.68)	-4.453 *-.094* (11.93)	-4.437 *-.094* (11.30)	-1.089 *-.023* (12.28)
Bicameral-ism	-12.74 -.320 (7.655)	-12.37 *-.310* (7.592)	-6.099 *-.153* (7.522)	-14.52* -.364* (7.925)	-10.56 *-.265* (7.233)	-8.259 *-.207* (9.948)
Network centrality x Bicameral-ism	51.66** *.701*** (19.31)	50.58** *.686*** (18.99)	43.57** *.591*** (16.67)	48.96** *.665*** (17.86)	45.84** *.622*** (17.31)	46.77** *.635*** (17.85)
Centre gov-ernment ide-ology (ln)	1.510 *.111* (2.784)					
Centre par-liamentary strength		1.507 *.091* (3.287)				
Left liber-tarian par-liamentary strength			2.210* *.356** (1.162)			
Left right polarisation				.635 *.188* (.703)		
Government fragmenta-tion (ln)					11.30 *.263* (8.023)	
Plurality electoral system						-15.00 *-.296* (11.79)
Mixed elec-toral system						-1.345 *-.033* (10.85)
Constant	65.37*** (7.067)	64.88*** (8.536)	57.68*** (7.184)	64.38*** (6.469)	59.12*** (7.993)	69.63*** (5.608)
R^2	.447	.444	.540	.464	.499	.509
R^2 Adjusted	.308	.305	.426	.330	.373	.345
N	21	21	21	21	21	21

Notes: Analysis units = country averages from 1992-2006. The table displays unstandardised and standardised regression coefficients (in italics), and standard errors (in parentheses), * $p < .1$, ** $p < .05$, *** $p < .01$.

Table 8.1.9 International political integration, bicameralism, and climate performance (continuation)

	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Network centrality	.422 *.009* (11.74)	1.675 *.035* (11.58)	-4.951 *-.105* (9.925)	-1.082 *-.023* (11.85)	8.363 *.177* (13.47)	-1.878 *-.040* (9.223)	-14.041 *-.245* 13.374
Bicameralism	-12.86 *-.323* (7.483)	-3.184 *-.080* (10.18)	-5.882 *-.148* (6.747)	-11.26 *-.283* (7.848)	-19.42** *-.487*** (9.119)	3.722 *.093* (7.715)	-7.894 *-.203* (7.512)
Network centrality x Bicameralism	44.07** *.598*** (18.40)	41.36** *.561*** (18.29)	49.15*** *.667**** (15.26)	49.52** *.672** (18.72)	56.42*** *.766**** (18.45)	13.25 *.180* (17.98)	43.443** *.631*** (19.661)
Fuel exports (ln)	-2.984 *-.168* (3.383)						
ENGO strength (ln)		-7.576 *-.319* (6.149)					
Corporatism			6.783** *.442*** (2.570)				
Climate change vulnerability				-21.80 *-.074* (63.17)			
EU membership					-16.92 *-.401* (12.71)		
Country size						-.000*** *-.740**** (.000)	.000* *-.473** (.000)
Constant	72.19*** (6.984)	81.60*** (12.13)	47.82*** (8.796)	76.62*** (25.57)	82.50*** (11.98)	68.89*** (4.094)	69.763 (3.589)
R^2	.463	.485	.607	.441	.493	.655	.757
R^2 Adjusted	.328	.357	.509	.301	.366	.569	.687
N	21	21	21	21	21	21	19

Notes: Analysis units = country averages from 1992-2006. The table displays unstandardised and standardised regression coefficients (in italics), and standard errors (in parentheses), * $p < .1$, ** $p < .05$, *** $p < .01$. Model 7 without multivariate outliers (New Zealand and Switzerland).

A comparison of the standardised regression coefficients in Table 8.1.9 reveals that the interaction between network centrality and bicameralism in a pairwise comparison is more important for climate performance than the other independent variables. This also applies to the analysis without outliers. The effect of policy diffusion via trading partners becomes significant again when the outliers (Japan, New Zealand, and Switzerland) are removed from the analysis. In contrast to the bivariate analysis, there is no support for the hypothesis that government fragmentation, left-wing ideology, or centre-party strength in parliament are associated with climate performance with and without outliers. With regard to control variables, as in a bivariate analysis, economic development contributes to climate performance. In addition, economic growth undermines climate performance in the analysis without outliers (the Netherlands, Norway, Spain, Sweden, and Switzerland). The expected negative effect of fuel exports is stable in the analysis without outliers (New Zealand and Switzerland) in pairwise comparison to the interaction effect. The positive relationship between corporatism and climate outcomes (insignificant in the analysis with outliers) is significant in the simultaneous analysis of the interaction between network centrality and bicameralism without outliers (New Zealand and Switzerland). This finding supports previous findings, suggesting that corporatism contributes to climate performance. The simultaneous analysis supports the finding that countries that are less densely populated are associated with better climate performance ($H_{cont}7b$). Population density contributes to climate performance when the joint effect of international political integration and bicameralism is considered and outliers are excluded (Netherlands, Norway, Sweden, and Switzerland). Country size undermines climate performance ($H_{cont}9$). In this model, the interaction between network centrality and bicameralism becomes insignificant. It is, however, significant in the analysis without outliers. Moreover, in the model without outliers, its effect is again more important for climate performance. In contrast to the bivariate results, there is no support for the hypotheses that industry-sector size ($H_{cont}2$), EU membership ($H_{cont}11$), and electoral rules ($H_{cont}14$) matter to climate performance in a simultaneous analysis with the interaction effect of network centrality and bicameralism, with and without outliers.

Thus, international political integration captured by network centrality contributes to climate performance in bicameral developed countries. This effect is, in pairwise comparisons, the most important driver of climate outcomes. In addition to state centrality in IGO networks, globalisation affects climate performance in developed countries via policy diffusion. The simultaneous analysis supports the theoretical expectations that economic development, corporatism, and population density contribute to climate performance, while economic growth, fuel exports and country size undermine it.

To conclude, among the dimensions of international economic integration, policy diffusion is associated with climate performance among developed countries. This is in line with hypothesis $H_{Int}3.3.1$. The effect of policy diffusion is independent of veto points, policy preferences of veto players on the left-wing right dimension and political corruption. As expected, ($H_{Int}1.3.2$ & H2.3.2), there is no support for the hypothesis that trade or capital openness matters for CO_2 emissions ($H_{Int}1.3.1$ & $H_{Int}2.3.1$). International political integration measured by state centrality in IGO networks has a positive effect on climate performance in bicameral systems ($H_{xveto}5$). There are no stable interaction effects of economic or political globalisation with political corruption.

8.2 Developing countries

This chapter analyses the joint influence of globalisation and domestic political institutions on climate performance in developing countries. Section 8.2.1 summarises the coding of the independent and dependent variables and examines the univariate distributions of the variables. The following section analyses additive effects of international integration and domestic political institutions on climate performance (8.2.2). Sections 8.2.3 to 8.2.5 investigates separately whether veto players and points, dimensions of political corruption and regime type moderate the effects of globalisation dimensions. Finally, Section 8.2.6 tests significant interaction effects of the three explanatory models simultaneously.

8.2.1 Univariate analysis

The independent and dependent variables are measured in country averages from 1992–2006. Tables 8.2.1–8.2.3 summarises their coding.

Table 8.2.1 Measurement of climate performance and economic and political globalisation

Variable	Measurement	Data Source
Climate performance	CO_2 emissions metric tons per capita levels divided by GDP per capita, PPP in constant 2011 US Dollars and standardised with the best-practice approach for developing Non-Annex I countries. Higher values indicate a better climate change mitigation performance.	World Bank (2016)
Economic globalisation	a. Trade openness: Logged % of the sum of imports and exports of domestic GDP corrected for population size. b. Capital openness**:** Logarithmised % of stock of foreign direct investment (FDI) inflows of GDP. c. Economic interdependence: Spatial lag variable that measures climate performance (see above) of a country's five most important trading partners based on the amount of exports and imports of commodities. Higher values indicate a better climate performance of a country's most important trading partners.	a. World Bank (2016 b. UNCTAT (2015) c. UN COMTRADE (2017)
Political globalisation	a. IGO memberships: Annual number of full country memberships in IGOs. Missing values and no state system member are coded as no membership. b. Centrality in IGO networks: Annual number of a country's indirect and direct IGO's ties to other countries via in 1.000.	a. Pevehouse et al. (2010) b. von Stein (no year)

Notes: Analysis units = country averages from 1992-2006. N=64. I added one to variables with an observed minimum of zero before logarithmising them.

Table 8.2.2 Measurement of veto players, political corruption, and regime type

Variable	Measurement	Data Source
Government ideology	Left, centre, and right government ideology: 1 – in the case of a presidential system a left-wing/ centre/ right-wing chief of executive, in the case of a parliamentary system a left-wing/ centre/ right-wing largest party in parliament. 0 – in all other cases. Parliamentary and presidential systems are identified using information from the 'system' variable from Cruz et al. (2016).	Cruz et al. (2015)
Ideological heterogeneity among veto players	Left/right polarisation among partisan veto player within political institutions with veto player status in domestic policy. 0 – no left – right polarisation, 1 – left – right polarisation	Cruz et al. (2016), Hathaway (2008), Henisz (2002), Jahn (2010)
Veto points	a. Government fragmentation: Logarithmised annual number of governmental parties. b. Presidentialism: 1 –the president has veto player status in domestic policy. 0– in all other cases. c. Bicameralism: 1 – The second legislative chamber has veto player status in domestic policy. 0 – In all other cases.	a. Cruz et al. (2016) b. Cruz et al. (2016)/ Cheibub et al. (2010) c. Hathaway (2008)
Political Corruption	a. Political corruption: Political Corruption Index b. Executive corruption: Executive Corruption Index c. Legislative corruption: Legislative corrupt activities d. Public sector corruption: Public Sector Corruption Index Higher values indicate higher values of political corruption.	a., b. & d. McMann et al. (2016) c. Coppedge et al. (2017) & Pemstein et al. (2017)
Regime type	a. Electoral democracy: 1 – Electoral democracy, 0 – No electoral democracy. b. Established democracy: 1 – Established democracy, 0 – No established democracy.	a. Cheibub et al. (2010) b. Freedom House (2015), Marshall et al. (2015)
Democracy qualities	a. Vertical accountability: Vertical Accountability Index b. Horizontal accountability: Horizontal Accountability Index c. Political rights: Diagonal Accountability Index d. Civil rights: Equality before the law and individual liberty index Higher values indicate higher values of democracy quality.	Coppedge et al. (2017); Pemstein et al. (2017); Lührmann et al. (2017)

Notes: Analysis units = country averages from 1992-2006. N=64. I added one to variables with an observed minimum of zero before logarithmising them. The time-series cross-sectional variables government fragmentation, bicameralism, government ideology, left/right polarisation and presidential veto player are zero in autocratic years and missing in democratic years of transition, interruption and interregnum. IGO membership and policy diffusion refer to country-averages from 1992-2005, network centrality from 1992-2003. Government ideology, left/right polarisation, bicameralism and presidential veto player, regime type variables receive 1 when it applies to at least half of the research period (i.e. 7 years).

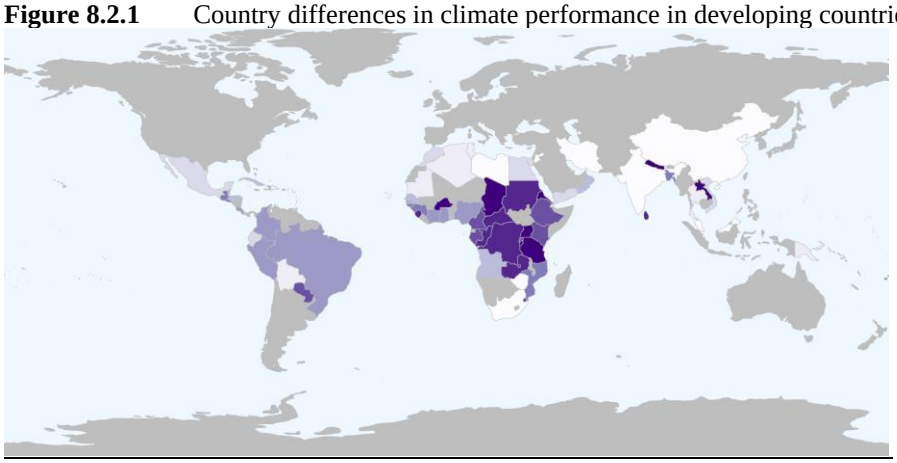
Table 8.2.3 Measurement of control variables

Variable	Measurement	Data Source
Economic Development	Natural logarithm of GDP per capita in constant 2010 US$.	World Bank (2016c)
Economic growth	Annual % growth rate of GDP at market prices based on constant local currency.	World Bank (2016a)
Industry group strength	a. Logarithmised % of the industry sector of GDP. b. Logarithmised fuel exports as % of merchandise exports.	a. World Bank (2016e) b. The World Bank Group (2016d)
ENGO strength	Logarithmised number of ENGOs in a country registered with the IUCN.	Bernauer et al. (2013)
Population density	Logarithmised population size divided by land area in m².	World Bank (2016b)
Population growth	Population growth.	World Bank (2016f)
Urban population	Urban population as % of total population.	World Bank (2016g)
Electoral system	a. Plurality electoral system: 1 – plurality electoral system, 0 – no plurality electoral system b. Mixed electoral system: 1 – mixed electoral system (plurality and PR), 0 – no mixed electoral system. Reference category: PR system.	Cruz et al. (2016)
Climate change Vulnerability	Climate change index, indicates climate change risk exposure on a scale from 0 to 1. Higher values indicate greater climate change risk exposure.	Bättig & Bernauer (2009).
Types of autocracy	a. Military dictatorship: 1 – Military dictatorship, 0 – all other cases b. Royal dictatorship: 1 – Royal dictatorship, 0 – all other cases Reference category: civil dictatorship	Cheibub et al. (2010, 2009)

Notes: Analysis units = country averages from 1992-2006. N=64. I added one to variables with an observed minimum of zero before logarithmising them. Climate change vulnerability = the Climate change index refers to the period from 1990-2005. Types of autocracies = dichotomous variables that indicate whether the political system has been classified as military, royal or civil dictatorship in most years of the research period (>7) from 1992-2006. The electoral system refers to the electoral rules of most years of the research period.

Climate performance varies among regions and within regions (see Figure 8.2.1). Some of this variance can be explained by economic development. Countries of Sub-Sahara Africa show in regional comparison the highest mean performance among developing countries. These results from their low levels of economic development (see Figures 8.2.2 & 8.2.3). East Asian and Pacific as well as North African countries with relatively high GDP per capita levels share relatively high CO_2 emissions. However, several West African countries with higher GDP per capita values perform well. Latin American countries have despite relatively high economic development levels comparatively low levels of global air pollution. Thus, it is of interest what explains cross-national variation in climate outcomes besides economic development. Climate performance is negatively skewed in the developing world. This results mainly from two outliers: China and South Africa. If I include them in the analysis they are identified as multiple outliers. In addition, the normality distribution of residuals assumption of OLS regression is violated when both countries are included in the analysis of the final model (see Figure A8.3.7). Therefore, the following sections exclude them from the analysis.

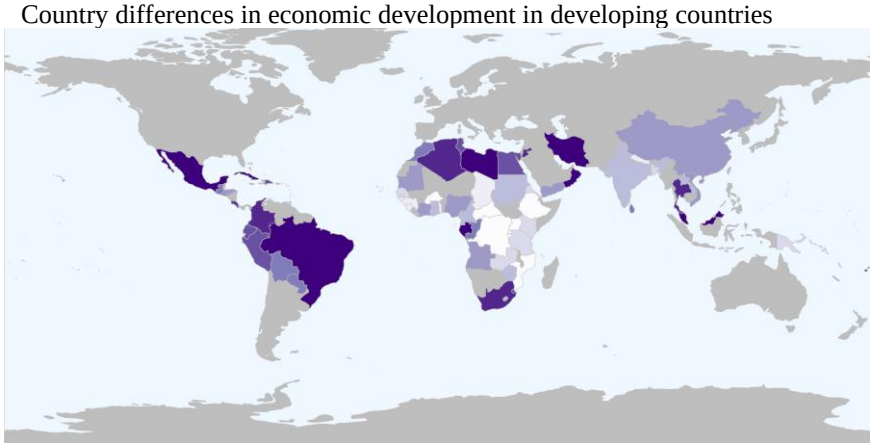
Figure 8.2.1 Country differences in climate performance in developing countries



	Mean	Me-dian	Std. dev.	Skew-ness	Kurto sis	Mini-mum	Maxi-mum	N
All countries	83.43	87.35	12.86	-2.36	7.55	28.87	99.16	66
Without China and South Africa	85.10	87.63	8.80	-.89	.42	60.24	99.16	64
East Asia and the Pacific	60.84	74.48	27.79					3
Latin America and the Caribbean	84.17	85.39	4.57					13
Middle East and North Africa	75.32	78.44	6.76					10
South Asia	85.36	91.37	13.97					4
Sub-Saharan Africa	87.09	90.42	12.27					36

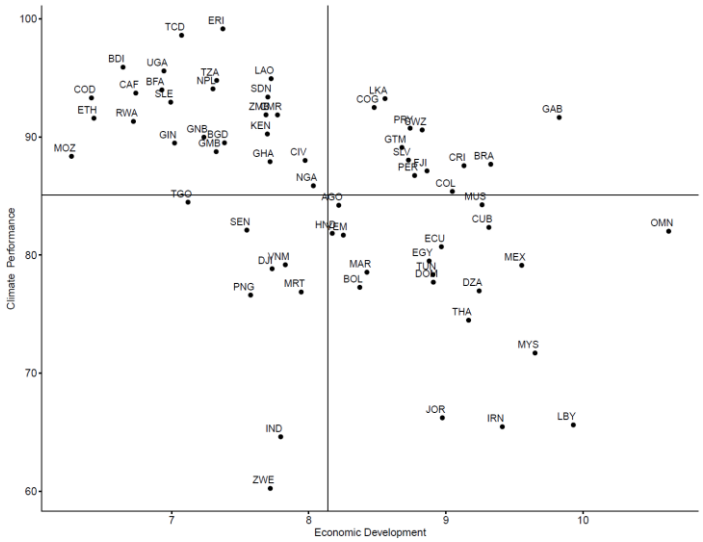
Notes: Analysis units = country averages from 1992-2006. The darker the colour the higher a country's climate performance. Missing countries are grey. Std.dev. = Standard deviation.

Figure 8.2.2 Country differences in economic development in developing countries



Notes: Analysis units = country averages from 1992-2006, N=66. The darker the colour the higher a country's climate performance. Missing countries are grey.

Figure 8.2.3 Economic development and climate performance in developing countries

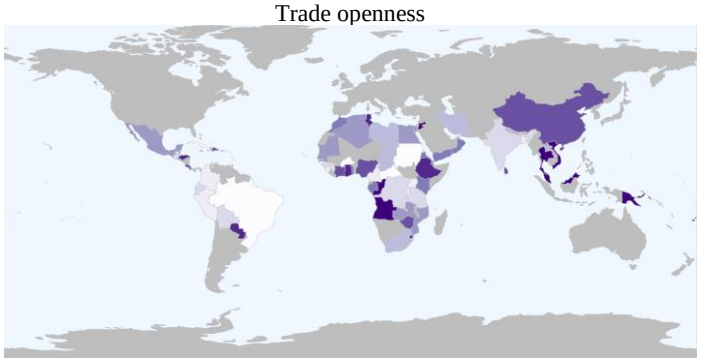


Notes: Analysis units = country averages from 1992-2006, N=64. Vertical and horizontal lines = average values of economic development and climate performance.

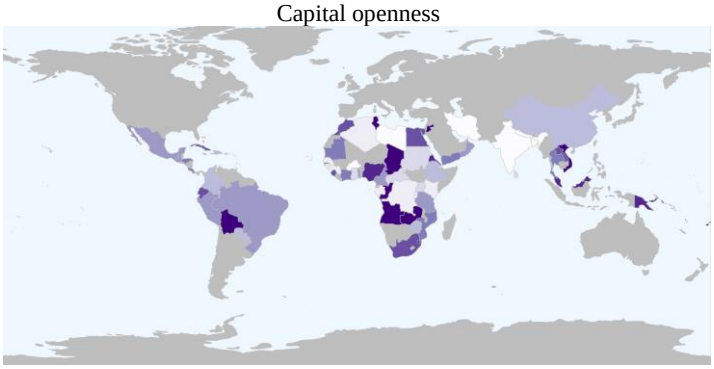
Table A8.3.1 in the annex summarises univariate statistics of my independent variables. Chapter A8.3.2 in the annex presents bivariate correlations among independent variables. Economic openness varies considerably among developing countries (see Figures 8.2.4 & 8.2.5). Comparing the world maps of trade openness and climate performance suggests that countries that are open to trade have relatively high CO_2 emissions. Developing countries also differ in capital openness. Bivariate correlations and the world maps illustrate that trade and capital openness do not correlate high with each other. It is therefore adequate to study them separately. Developing countries vary considerably with regard to policy diffusion among trading partners.

Figure 8.2.4 Country differences in international economic integration in developing countries

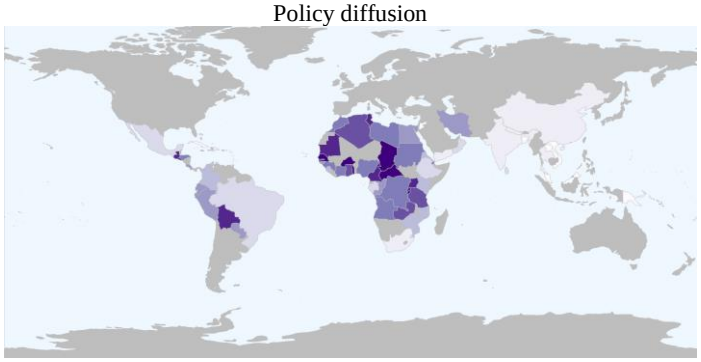
Trade openness



Capital openness

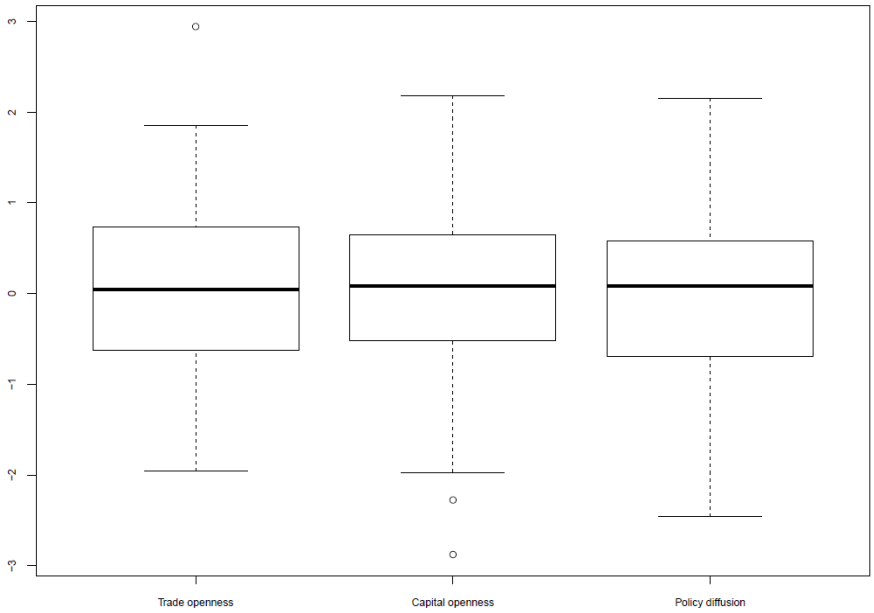


Policy diffusion



Notes: Analysis units = country averages from 1992-2006, N=66. The darker the colour the higher a country's climate performance. Missing countries are grey.

Figure 8.2.5 Variation in international economic integration in developing countries



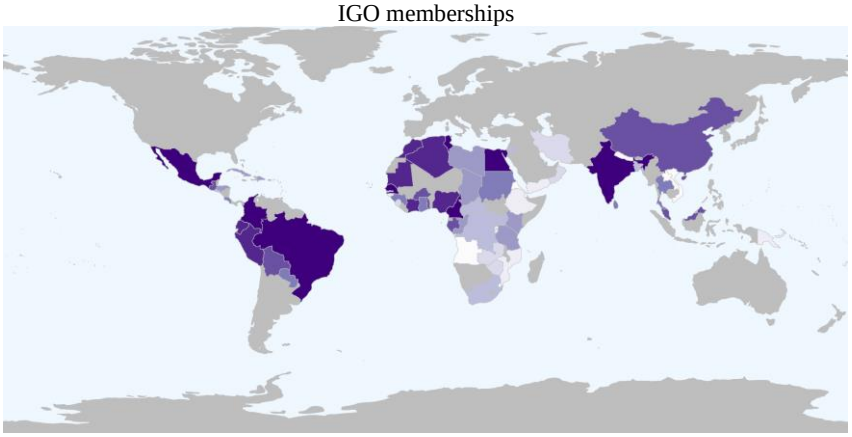
	Mean	Median	Std.dev.	Minimum	Maximum
Trade openness	-.04	-.03	.18	-.39	.49
Capital openness	2.67	2.74	.88	.15	4.58
Policy diffusion	60.53	61.33	9.32	37.58	80.58

Notes: Analysis units = country averages from 1992-2006. The boxplots display z-scores. N=21. Std.dev. = Standard deviation.

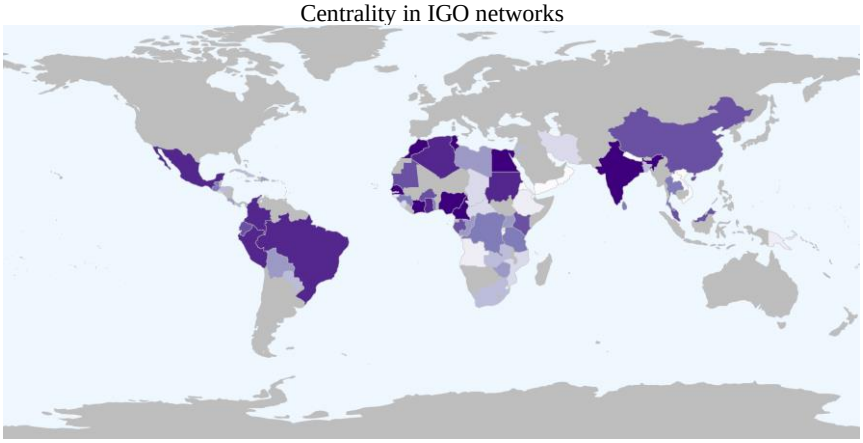
Poor countries differ considerably with regard to political globalisation (see Figures 8.2.6 & 8.2.7). It makes little difference whether it is captured by state memberships in IGOs or network centrality. Therefore, there is no difference in their relationship with climate outcomes. The visual inspection suggests no positive relationship with climate performance. Sub-Saharan African countries with low memberships in IGOs and IGO network emit low levels of CO_2.

Figure 8.2.6 Country differences in international political integration in developing countries

IGO memberships

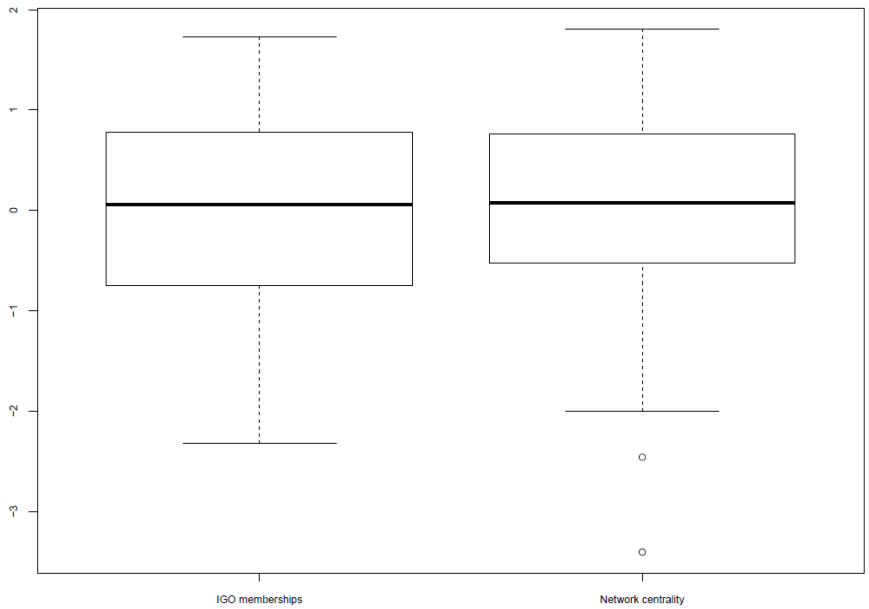


Centrality in IGO networks



Notes: Analysis units = country averages from 1992-2006, N=66. The darker the colour the higher a country's climate performance. Missing countries are grey.

Figure 8.2.7 Variation in international political integration in developing countries



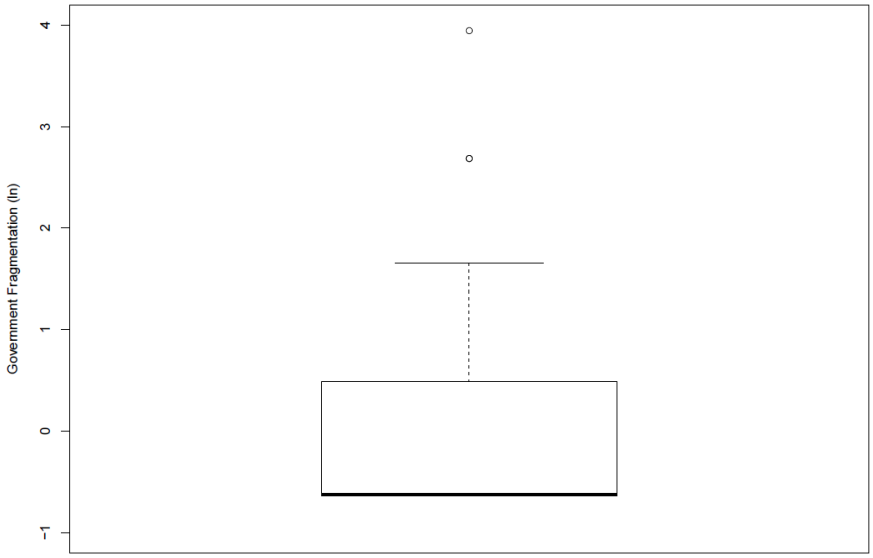
	Mean	Median	Std.dev.	Minimum	Maximum
IGO memberships	62.47	61.33	14.45	28.92	80.58
Network centrality	5.32	5.38	.82	2.51	6.80

Notes: Analysis units = country averages from 1992-2006, N=64. The boxplots display z-scores. Std.dev= Standard deviation.

Most electoral democracies in my sample have been more than the half of the research period presidential democracies (16). Seven electoral democracies are parliamentary democracies and two semi-presidential democracies

for at least seven years. Presidential democracies exhibit a relatively high mean climate performance (see Table 8.2.4). Yet, it is similar to the mean performance of electoral democracies in general. Only nine countries have at least half of the research period a second chamber of the legislature with veto power. They perform, on average, worse than electoral democracies in general. Government fragmentation is skewed (see Figure 8.2.8). Most countries are characterised by no or very few government parties. Unfortunately, because of data availability, there is little variation on government ideology indicators and the measure of ideological heterogeneity among veto players. Based on the univariate analysis, there is little support for the claim that the policy preferences of veto players and veto points should explain variation in climate performance in the developing world.

Figure 8.2.8 Variation in government fragmentation among developing countries



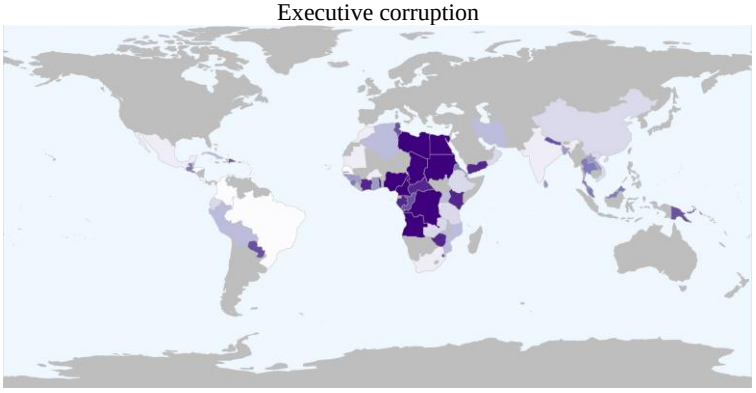
	Mean	Median	Std.dev.	Minimum	Maximum
Government fragmentaion	.33	.00	.53	.00	2.41

Notes: Analysis units = country averages from 1992-2006. The boxplot displays z-scores. N=64. Government fragmentation is logarithmised. Std.dev. = Standard deviation.

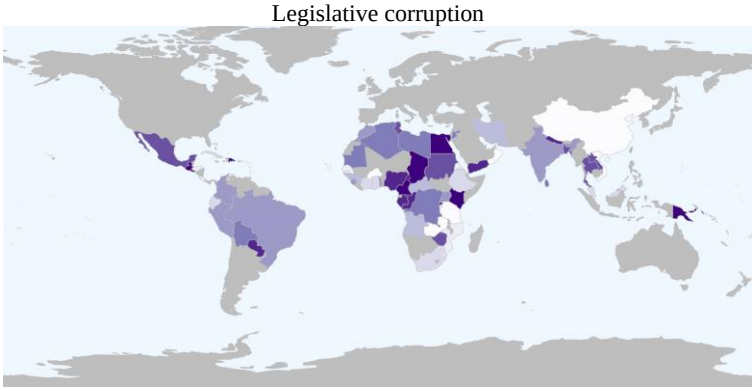
Executive and public sector corruption are highly correlated (.792***). Nonetheless, there are country differences with regard to the presence of executive, legislative, and public sector corruption (Figure 8.2.9). Nearly half of the sample exhibit high values of executive, public sector and legislative corruption (Figure 8.2.10). There is little variation in mean climate performance of countries with above-average executive, legislative or public sector corruption (Table 8.2.4). African countries share high values of political corruption. Many African countries with high levels of executive and public sector corruption are characterised by low levels of trade and capital openness and high values of climate performance (see Figures 8.2.2 & 8.2.9). This supports the hypothesis that political corruption hinders international trade and investment and thus lowers negative scale and composition effects of economic growth on climate performance. These countries also show low levels of economic development (see Figure 8.2.2).

Figure 8.2.9 Country differences in political corruption among developing countries

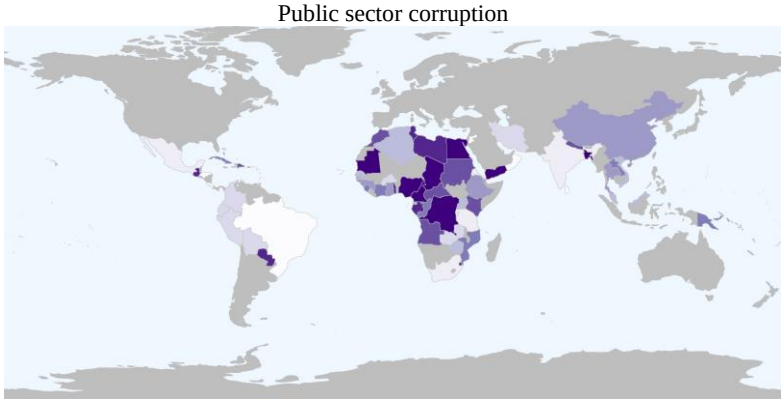
Executive corruption



Legislative corruption

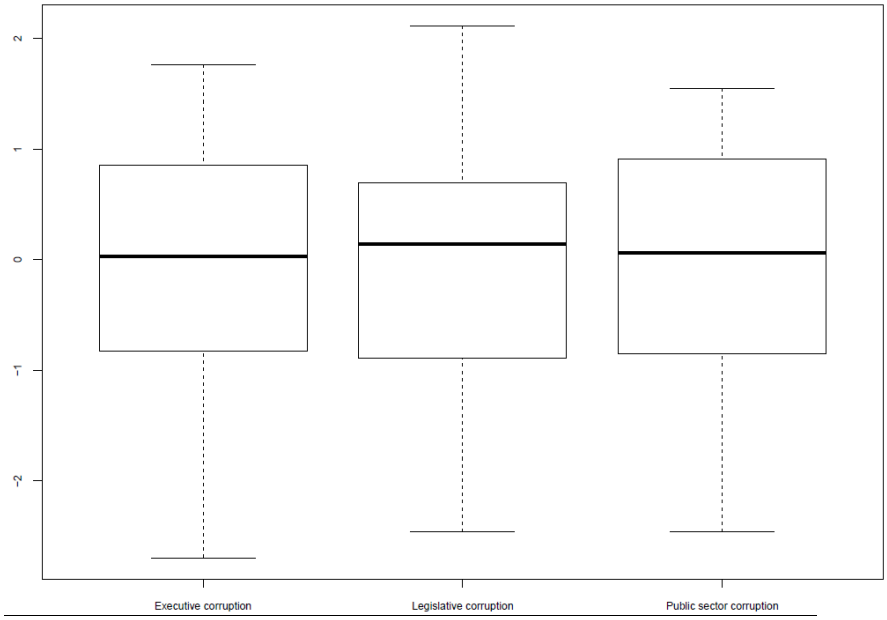


Public sector corruption



Notes: Analysis units = country averages from 1992-2006, N=66. The darker the colour the higher a country's climate performance. Missing countries are grey.

Figure 8.2.10 Variation in political corruption in developing countries



	Mean	Median	Std.dev.	Minimum	Maximum
Executive corruption	.63	.64	.19	.12	.97
Legislative corruption	.62	.73	.77	-1.28	2.26
Public sector corruption	.64	.65	.21	.12	.96

Notes: Analysis units = country averages from 1992-2006. The boxplots display z-scores. N=64. Std.dev. = Standard deviation.

Given the available data, there are more autocracies than democracies in my developing-country sample. My sample consists of 25 countries that have been at least seven years electoral democracies. 16 countries are classified as established democracies for at least seven years. With the exception of South Africa, there are no established democracies in Sub-Sahara Africa and few countries are classified as electoral democracies. Electoral democracies perform better than established democracies. Yet, this may result from their lower levels of economic development. There are 45 countries that are classified as autocracies for at least seven years. Autocracies consist mainly of civilian dictatorships (23). There are 18 military dictatorships and four monarchies. Among types of autocracy, military dictatorships perform better. Overall, the visual inspection suggests that there are no systemic differences in climate performance between democracies and autocracies.

Table 8.2.4 Mean comparison of climate performance of developing countries

	Mean	N
Presidential democracies (Cheibub)	85.96	16
Presidential democracies (DPI)	79.89	13
Bicameralism	74.25	9
Above average levels of government fragmentation	82.19	23
Left government ideology	66.06	4
Right government ideology	86.30	6
Left right polarisation among veto players	74.25	9
Above average public sector corruption	84.66	38
Above average legislative corruption	84.28	35
Above average executive corruption	86.17	36
Above average political corruption	85.56	32
Electoral democracies	84.88	25
Established democracies	79.32	16
Royal dictatorships	79.34	4
Civilian dictatorships	79.70	23
Military dictatorships	86.57	18
Above average vertical accountability	83.25	28
Above average horizontal accountability	82.83	37
Above average political rights	85.11	38
Above average civil rights	81.33	16

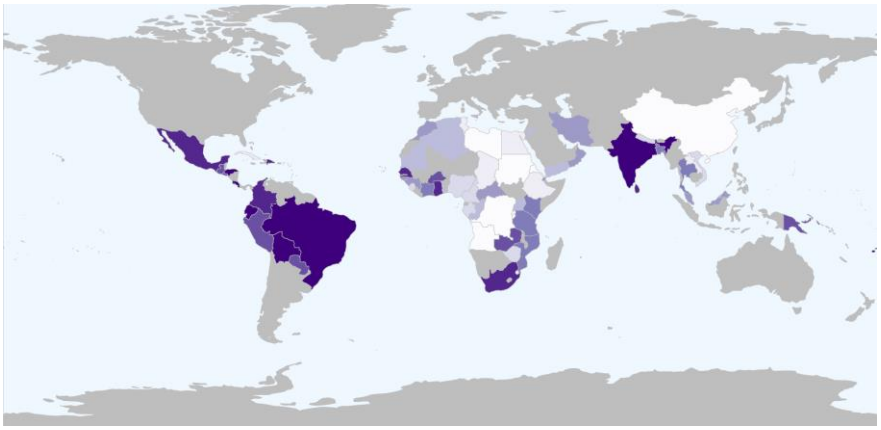
Notes: Analysis units = country averages from 1992-2006, N=64.

Political rights are highly correlated with civil rights (.787***) and vertical accountability (.821***). There is a strong positive relationship between civil rights and vertical accountability (.816***).[83] Nonetheless, developing countries perform in different ways on the democracy-quality dimensions. Levels of political rights, civil rights, horizontal and vertical accountability vary considerably among them (see Figures 8.2.11 & 8.2.12). This applies to democracies and autocracies. For instance, while most African countries are classified as non-democracies, there is considerable variation with regard to democratic qualities among them. Latin American countries share very high levels of electoral accountability but differ with regard to checks and balances, political and civil rights. Outside Latin America, developing countries exhibit higher values of horizontal than vertical accountability. Few states perform very well on democratic qualities (see Figure 8.2.12). About half of all considered countries can be found on the lower half of the scales on vertical and horizontal accountability as well as political and civil rights. Developing countries vary in particular regarding political rights. Few outliers perform very bad regarding vertical accountability. This is in line with the observation that elections of political authorities occur in most countries.

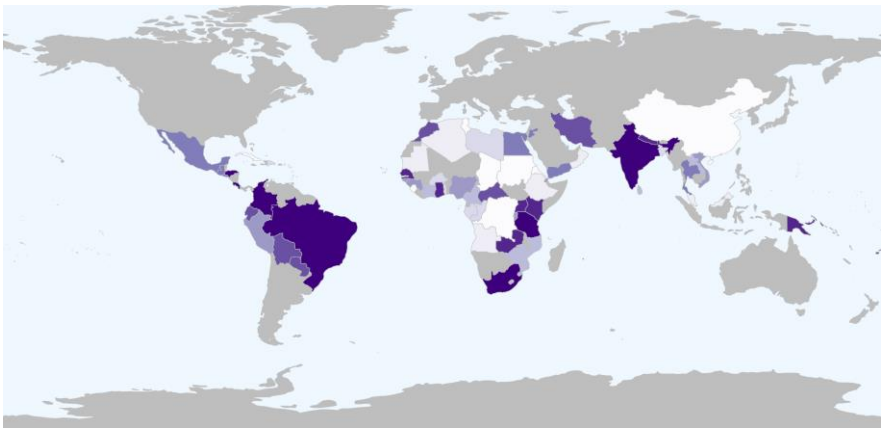
[83] The other correlations among regime type and democracy quality indicators are lower .7.

Figure 8.2.11 Country differences in democratic qualities among developing countries

Vertical accountability



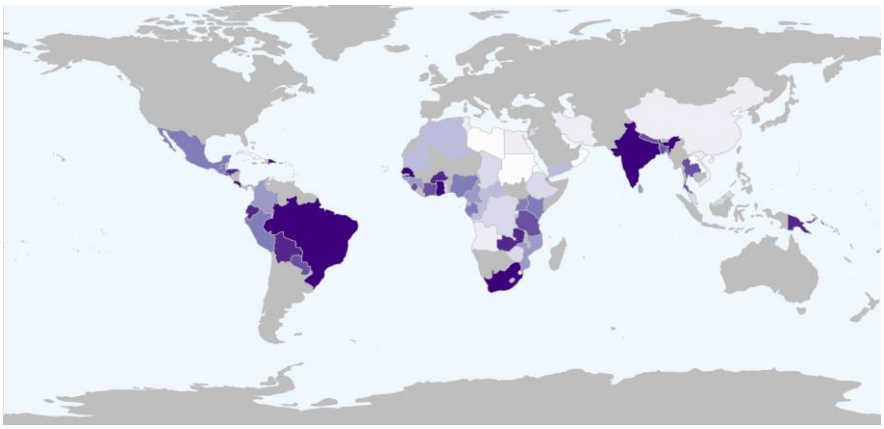
Horizontal accountability



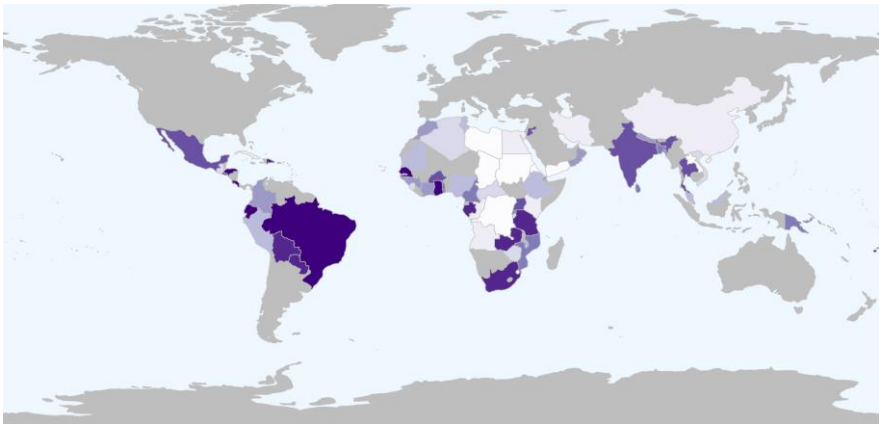
Notes: Analysis units = country averages from 1992-2006, N=66. The darker the colour the higher a country's climate performance. Missing countries are grey.

Figure 8.2.11 Country differences in democratic qualities among developing countries (continuation)

Political rights

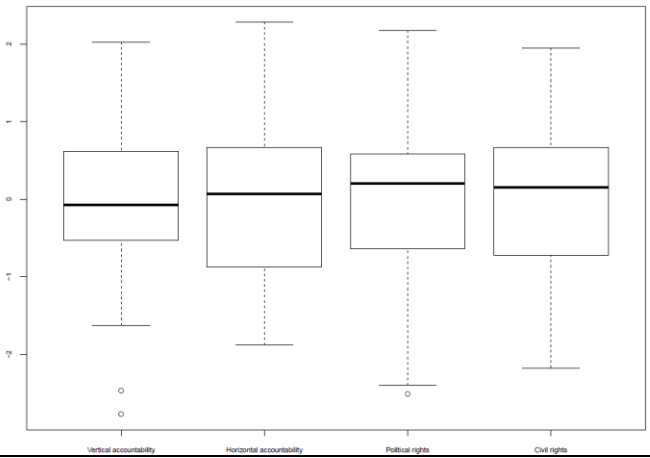


Civil rights



Notes: Analysis units = country averages from 1992-2006, N=66. The darker the colour the higher a country's climate performance. Missing countries are grey.

Figure 8.2.12 Variation in democratic qualities in developing countries



	Mean	Median	Std.dev.	Minimum	Maximum
Vertical accountability	.33	.28	.64	-1.44	1.62
Horizontal accountability	.06	.10	.69	-1.25	1.64
Political rights	.38	.52	.75	-1.50	1.99
Civil rights	.56	.59	.22	.08	.98

Notes: Analysis units = country averages from 1992-2006. The boxplots display z-scores. N=64. Std.dev. = Standard deviation.

To conclude, the univariate analysis suggests that regime type alone cannot explain differences in climate performance. It is an empirical question whether democratic qualities help to explain country differences in climate performance. Countries with above-average values related to political rights perform better than countries with

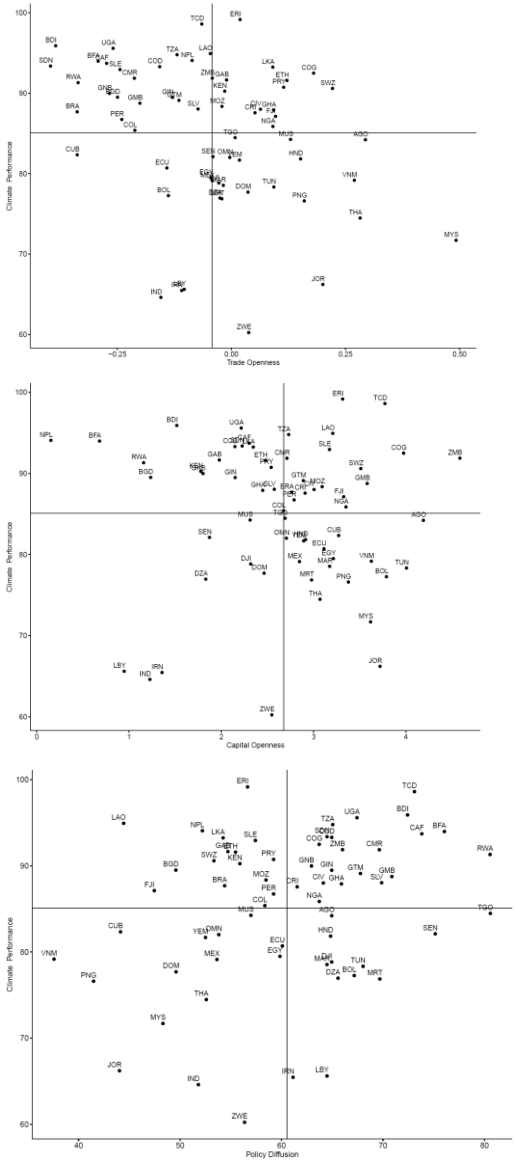
above-average values on other democracy dimensions. This is also the dimension in which the largest number of countries has above-average values.

8.2.2 International integration and climate performance

Before testing the interaction effects between international integration and domestic political institutions, this section examines their additive effects on CO_2 emissions. To consider the claim that model complexity may affect regression results[84], regression models with control variables only (ENGO strength, industry-sector size, fuel exports, GDP per capita, economic growth, climate change vulnerability, urban population size) and globalisation indicators are initially estimated. In additional models, this study also controls electoral rules and autocratic regime types (see Section A8.3.8). Second, in separate regression models, indicators of ideological heterogeneity among veto players, veto points, regime type, and political corruption are added to the regression model (see Chapter A8.3.3). Several variable pairs are not included simultaneously to avoid problems with multicollinearity.[85] Finally, a model is estimated that includes significant independent variables from step two, as well as controls and globalisation indicators. This model is presented below in Figures 8.2.11 and 8.2.12. Its results remain stable when regional performance is included in place of policy diffusion (see Figures A8.3.6 & A8.3.7 in the annex), and also when additional controls, such as autocratic regime types, are controlled (see chapter A8.3.5 in the annex).
The multivariate analysis supports the theoretical expectation that trade openness undermines climate performance in developing countries ($H_{Int}1.3.2$). This result is stable across all models. Many countries with below-average levels of trade openness perform at above-average levels when it comes to climate performance. By contrast, most countries with above-average levels of trade openness share relatively high CO_2 emission levels. Nonetheless, a considerable number of countries deviates from this pattern. In contrast to $H_{Int}2.3.2$, capital openness has a significant positive effect in the final model. This effect is not stable in all models. The scatter plot (Figure 8.2.13) indicates no clear positive bivariate effect. The question is whether systemic country differences cause deviations from the linear relationship of trade and capital openness with climate performance. As expected ($H_{Int}3.3.2$), there is no support for the hypothesis that policy diffusion influences global air pollution.
International political integration, measured by state involvement in IGOs or state centrality in IGO networks, has no effect on climate performance (see also Figure 8.2.14). This is in line with the expectation that political globalisation has more influence on climate commitment than performance (see Chapter 3).

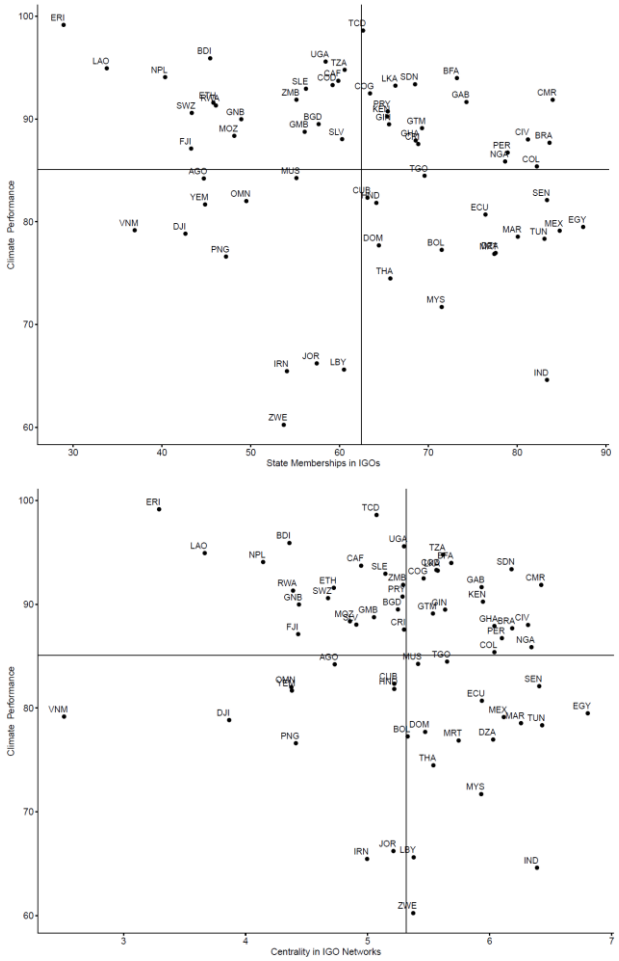
[84] Following Jahn (2013, p. 378), the number of independent variables should not be higher than 1/3N-1 (constant) (see also Chapter 8.1). This means with N=64 a maximum of 20 variables.
[85] Executive and public sector corruption (r=.792***), political and civil rights (.789***), political rights and vertical accountability, and civil rights and vertical accountability (r= .821***, r= .816***) are highly correlated (see Chapter A3.8.2). Veto-player and point indicators also correlate highly with each other as they consider democracy (presidential veto player (DPI) and left/right polarisation (r=.750***), bicameralism and the number of government parties (r=.724***).

Figure 8.2.13 International economic integration and climate performance in developing countries



Notes: Analysis units = country averages from 1992-2006, N=64. The vertical and horizontal lines represent average values of international economic integration and climate performance.

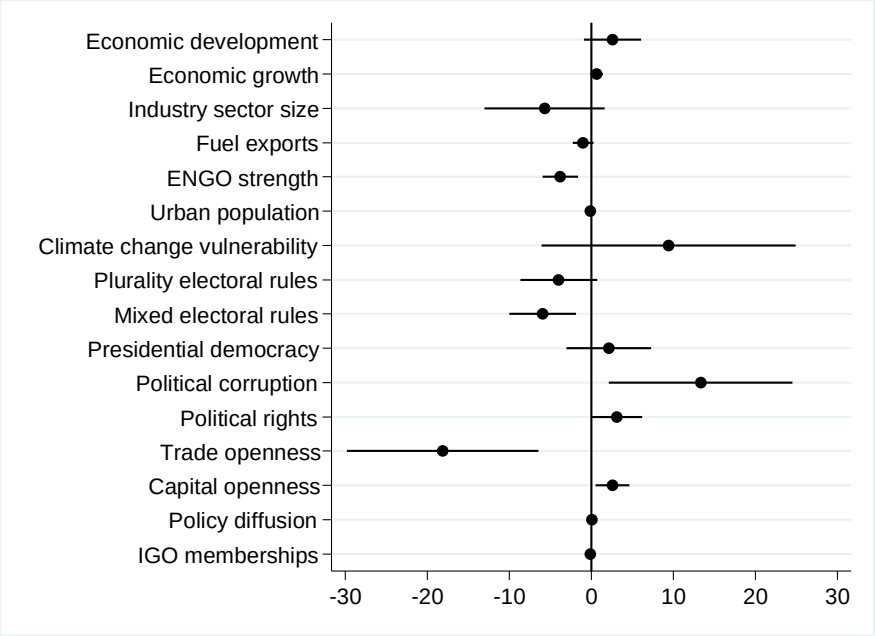
Figure 8.2.14 International political integration and climate performance in developing countries



Notes: Analysis units = country averages from 1992-2006, N=64. The vertical and horizontal lines represent average values of international political integration and climate performance.

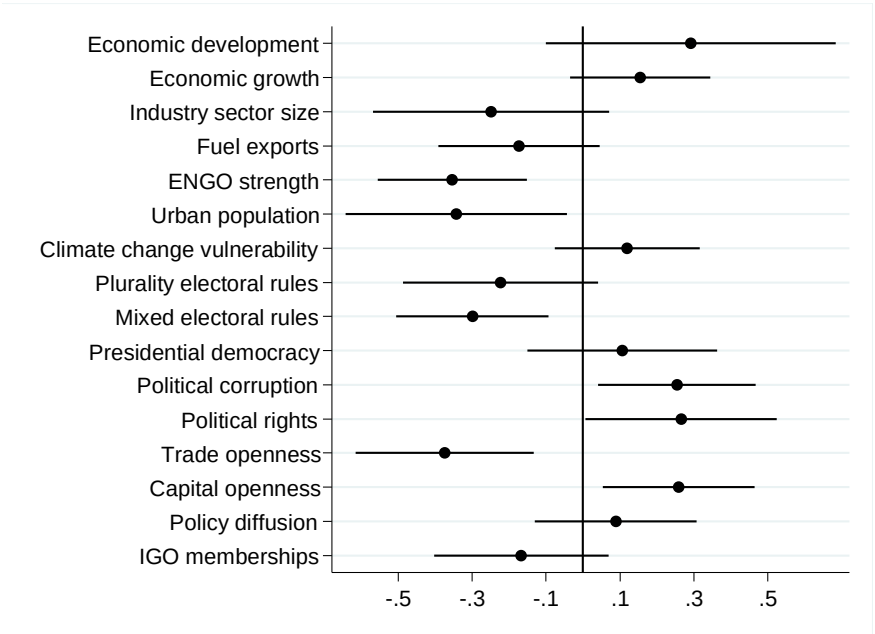
There is no support for the hypothesis that veto points and ideological heterogeneity among veto players influence climate performance. Only some models indicate that presidential democracies captured by the DPI or Cheibub et al. (2010) data perform better than other countries. The significant effect of political corruption on global air pollution in the model presented below is not stable across models. There is likewise no support for the hypothesis that specific political-corruption dimensions matter ($H_{Corr}1.3.2$, $H_{Corr}2.3.3$, & $H_{Corr}3.2$). Among democratic qualities and regime-type variables, only political rights contribute to climate performance when political corruption is controlled. While the bivariate analysis indicates a negative effect of economic development, its effect is positive and insignificant in the multivariate analysis (see Figures 8.2.15 & 8.2.16). It must be considered that the dependent variable already takes economic development into account. The present study also estimates the same model, using the squared term of the mean-centred GDP per capita to test the Environmental Kuznets Curve hypothesis. As there is no significant curvilinear effect of economic development on climate performance in the developing world, only the linear term of GDP per capita is included in the model below. In contrast to the theoretical expectations ($H_{cont}4$), the number of ENGOs are associated with higher emission levels. Urban population contributes to global air pollution ($H_{cont}8a$). Regional performance is associated with lower CO_2 emission levels ($H_{cont}12$) (see Figures A8.3.6 & A8.3.7 in the annex). However, this effect remains insignificant in the analysis of interaction effects in the next section. As expected, countries with plurality and mixed electoral rules are associated with higher levels of CO_2 emissions than other countries ($H_{cont}14$). Figures 8.3.15 and 8.3.16 present the results of the simultaneous analysis (see Table A8.3.9 in the annex) of significant political institutional variables.

Figure 8.2.15 Explanatory factors of climate performance in developing countries (Multivariate regression): Unstandardised regression coefficients



Notes: Unstandardised Regression Coefficients with 90% Confidence Intervals, R^2=.593, R^2 Adjusted==.454, Analysis units = country averages from 1992-2006, N=64. To compare effects of independent variables see Figure 8.2.16

Figure 8.2.16 Explanatory factors of climate performance in developing countries (Multivariate regression): Standardised regression coefficients



Notes: Standardised Regression Coefficients with 90% Confidence Intervals, R^2=.593, R^2 Adjusted=.454, Analysis units = country averages from 1992-2006, N=64, 90% confidence interval, significant 99%: ENGO strength, 95%: trade openness, capital openness, 90%: political rights, political corruption, urban population.

To conclude, as expected, trade openness is associated with lower climate performance in developing countries (H1.1.2). This effect is substantial: the strongest effect on climate performance, relative to the other independent variables included in the model (see Figure 8.3.16). In contrast to H2.12., the results indicate no stable effect of capital openness. The scatter plot suggests that a third variable may moderate this effect. In comparison to H4.3.2, international political integration has no effect on climate performance. This is in line with the expectation that IGO involvement has more influence on climate commitment than performance (see Chapter 3). In contrast to the theoretical expectations, countries with higher levels of political rights perform better.

8.2.3 Joint influence of international integration and domestic political institutions

Is the effect of globalisation on climate performance in developing countries moderated by domestic political institutions? This chapter examines hypotheses derived from the three explanatory approaches: the veto-player, political-corruption, and regime-type approaches (see Chapter 5). To consider model complexity, I begin by examining the three explanatory approaches separately. Several political institutional variables in each explanatory approach correlate highly with each other. To avoid problems with multicollinearity, the respective hypotheses have been tested in separate regression models. Second, I examine significant interaction effects with the highest explanatory power of each explanatory approach simultaneously. To develop a final model, I re-examine this model by testing whether specific variables in each explanatory approach are decisive. All models control for ENGO strength, industry size, fuel exports, climate change vulnerability, urban population, GDP per capita and economic growth. A robustness analysis is used to consider additional variables. Additionally, jack-knife analyses based on world regions (IIASA, 2004) are used. As in Chapter 6 and the analysis of developed countries, marginal-effects plots are interpreted and constituent variables are mean-centred to avoid problems with non-essential multicollinearity.

There is no support, either for an independent effect of international political integration – captured by IGO memberships or state centrality in IGO networks – or for an interaction with veto players. Thus, neither ideological heterogeneity among veto players or government ideology, nor specific veto points moderate the effect of international political integration. These results also indicate no joint effect with regime type – electoral/established democracy or specific democracy-quality dimensions. Finally, there is no joint effect of forms of political corruption and international political integration. The previous section has shown that there is no linear effect of policy diffusion on climate performance in developing countries. The statistical analysis also indicates no joint effect with domestic political institutions, based on the three explanatory approaches. By contrast, the effects of trade and capital openness are moderated by domestic political institutions and institutional quality. The following section will describe these results in more detail.

Veto-player approach

Trade openness undermines climate performance in countries without democratic veto points, democratic left/right polarisation, or democratic left- or right-wing government ideology. These interactions remain stable when they are tested simultaneously.[86,87] The model with left/right polarisation has the highest explanatory power among veto-player models. When it comes to veto points, the model in which trade interacts with a presidential veto player explains the largest proportion of the variation in climate performance. Capital openness contributes to climate performance in democracies with left-wing government ideology and has a negative effect in democracies with right-wing government ideology. However, the low variance of the government ideology variables must be considered. When political corruption and political rights are controlled, there is a significant positive effect of capital openness in countries with below-average government fragmentation. Capital openness supports climate protection in non-presidential democracies (indicator from Cheibub et al., 2010).[88] This model has the highest explanatory power.

In sum, the results of the separate analysis of the veto-player approach suggest that there is a negative effect of trade openness in countries without democratic veto points and ideological heterogeneity among veto players. Capital openness has a positive effect in countries with below-average government fragmentation and non-presidential democracies.

Political-corruption approach

There is a significant negative effect of trade openness only in countries with average values for executive, legislative, and public sector corruption. The model involving executive corruption has the highest explanatory power. While there are no interactions of capital openness with executive or legislative corruption, capital openness contributes to climate performance in countries with below-average or very low public sector corruption values.[89]

Regime-type approach

Trade openness is negatively associated with climate performance in established and electoral democracies. There is also a significant but weaker negative effect of trade openness on non-established democracies. Accordingly, trade openness has a negative effect in countries with above-average values of vertical and horizontal accountability and political and civil rights. These effects of international trade are insignificant in countries with high

[86] The interactions of trade openness with bicameralism and government fragmentation cannot be tested in the same model because they are highly correlated. Likewise, the interactions of right-wing government ideology and left/right-polarisation with trade openness have not been included in the same model.

[87] The results are stable when political corruption and political rights are controlled.

[88] A significant interaction between bicameralism and capital openness becomes insignificant when political rights and political corruption are controlled.

[89] The results remain stable if political rights and presidential democracy are controlled.

levels of these democratic qualities. There is a clear negative effect of trade openness in countries with above-average values of political rights. Capital openness has a significant positive effect in electoral democracies, but not in established democracies. It also has a significant positive effect in countries with below-average vertical accountability and political and civil rights.[90] The models in which trade and capital openness interact with political rights have the highest explanatory power.

Simultaneous analysis of the hypotheses of the three explanatory approaches

The separate analysis of the explanatory models above suggests that the effects of trade and capital openness are moderated by veto players, aspects of regime type, and forms of political corruption. To develop a final model, the present study has tested significant interactions with the highest explanatory power simultaneously: trade openness and presidential democracy, capital openness and presidential democracy, trade openness and political rights, capital openness and political rights, trade openness and public sector corruption, capital openness and public sector corruption (see Figure 8.2.17). This makes it possible to consider model complexity and problems with multicollinearity. With regard to the interaction between international integration and veto players and points, the interaction between a veto-point measure and international integration (with the highest explanatory model) has been applied, due to the low variance of government ideology and left/right polarisation variables. The model tests the interaction effects of trade and capital openness with public sector corruption, given that capital openness has shown a significant interaction with public sector corruption only. The interaction between capital openness and political rights remains unstable in robustness analyses (jack-knife analyses based on world regions, IIASA, 2004). The second step estimates the simultaneous model, using the interactions of trade and capital openness with civil rights (see Figure 8.2.18). In a separate analysis, the models with an interaction between capital openness and civil rights have also shown a high explanatory power. Robustness analyses have been applied to this model. Its findings remain the same if regional performance is controlled, instead of policy diffusion via trading partners. The results remain the same when electoral rules or country size, climate commitment, autocratic-regime types, parliamentary and semi-parliamentary democracy or electoral rules are considered. The model also shows no problem with multicollinearity and remains stable with robust standard errors (robust regression).

Is the effect of trade and capital openness moderated by veto points? The results above suggest that there is a negative effect of trade openness in countries without democratic veto players and a positive effect of capital openness in non-presidential democracies and countries with low levels of government fragmentation. The simultaneous analysis (Figure 8.2.17 and 8.2.18) suggests a significant negative effect of trade openness in non-presidential democracies.[91,92] In the simultaneous analysis, the interactions of trade and capital openness with government fragmentation (in place of presidential democracy) have been tested. The other institutional variables in the veto-player approach show little variance among developing countries. The negative effect of trade openness becomes stronger with government fragmentation. This effect is significant for countries with an average or below-average number of government parties. The positive effect of capital openness becomes stronger with government fragmentation. So far, the analysis suggests that the interactions between veto points and economic openness remain stable. Trade openness has a negative effect in countries without veto points; the effect of capital openness is moderated by presidential democracy and government fragmentation. However, when the interactions of trade and capital openness with electoral democracy are tested simultaneously (see below), the joint effects of economic openness and presidential democracy become insignificant.

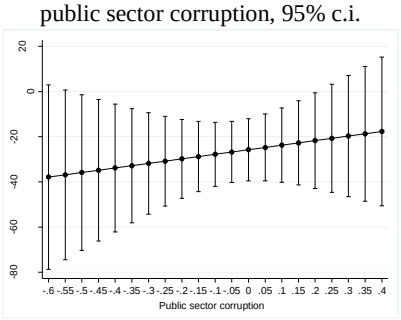
[90] The results remain the same when political corruption and presidential democracy are controlled.

[91] The positive effect of capital openness in non-presidential democracies becomes negative when South African countries are removed from the analysis.

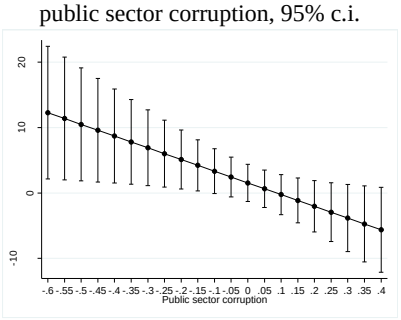
[92] These results remain the same when the reference category is parliamentary democracy, i.e. when the model controls for semi-parliamentary and autocracy types. They are also stable when additional controls are added (climate commitment, country size).

Figure 8.2.17 Simultaneous analysis of the interaction effects of trade and capital openness with public sector corruption, political rights, and presidential democracy

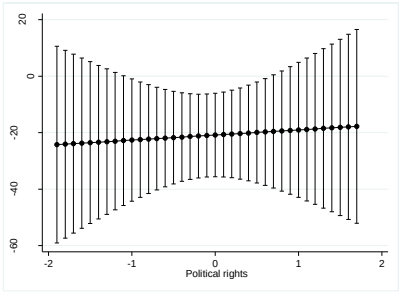
Trade openness by public sector corruption, 95% c.i.



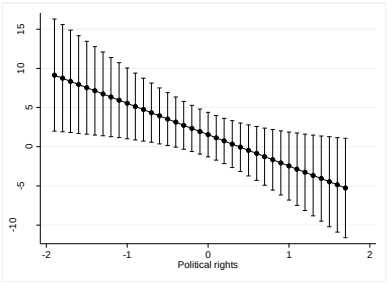
Capital openness by public sector corruption, 95% c.i.



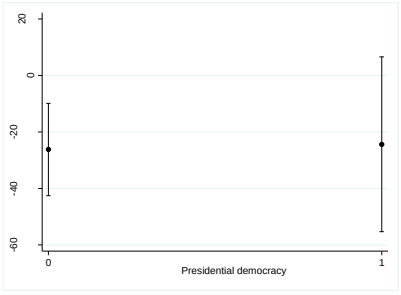
Trade openness by political rights[a], 95% c.i.



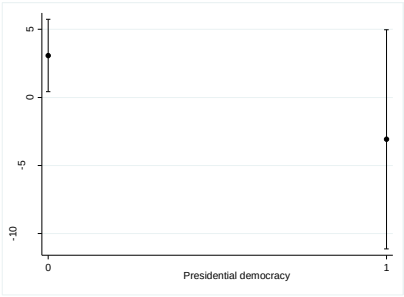
Capital openness by political rights, 95% c.i.



Trade openness by presidential democracy, 95% c.i.

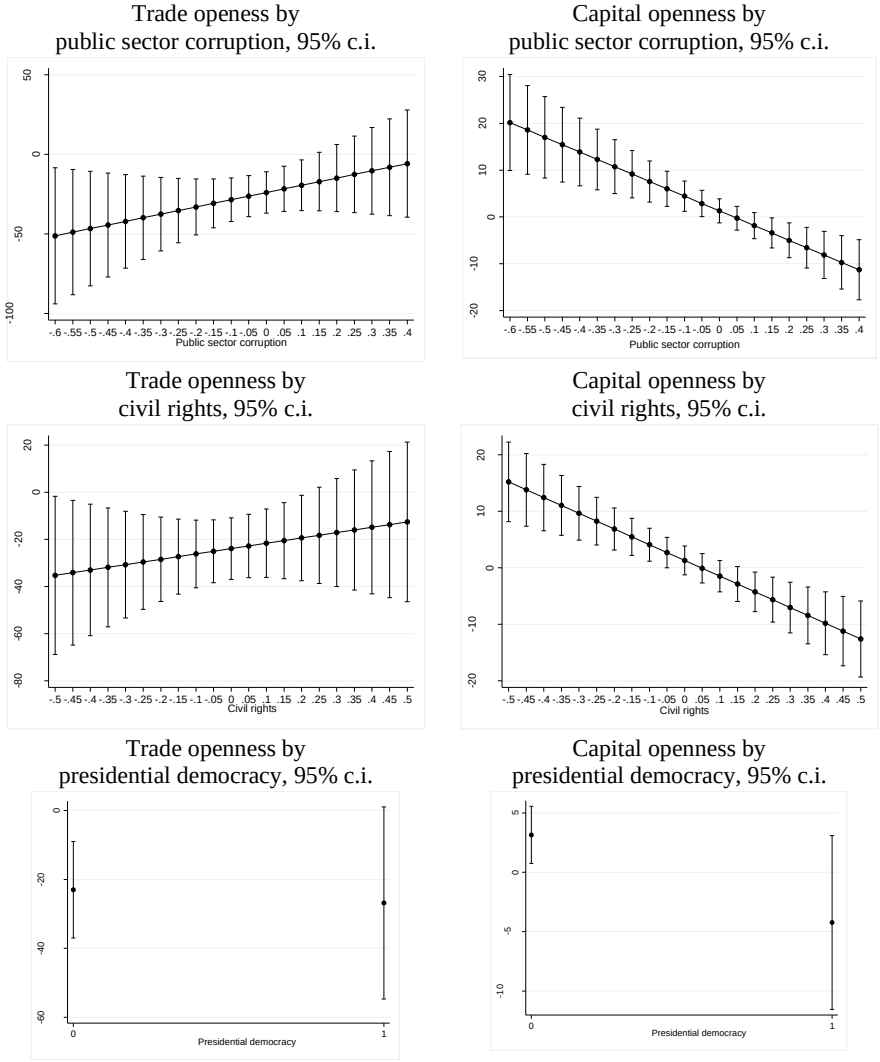


Capital openness by presidential democracy, 95% c.i.



Notes: The interaction effects shown are tested simultaneously. The multivariate model controls ENGO strength, industry size, fossil fuel exports, economic development, economic growth, climate change vulnerability, policy diffusion and IGO memberships. Analysis units = country averages from 1992-2006, N=64, R^2 = .665, Adjusted R^2 = .509. [a] This figure is based on the analysis of the sample without Pacific Asian countries. c.i. = confidence interval.

Figure 8.2.18 Simultaneous analysis of the interaction effects of trade and capital openness with public sector corruption, civil rights, and presidential democracy



Notes: The interaction effects shown are tested simultaneously. The multivariate model controls ENGO strength, industry size, fossil fuel exports, economic development, economic growth, climate change vulnerability, policy diffusion, IGO memberships. Analysis units = country averages from 1992-2006, N=64, R^2 = .722, Adjusted R^2 = .593. c.i.= confidence interval.

The interaction between capital openness and government fragmentation also becomes insignificant and the interaction between trade openness and government fragmentation is unstable in the robustness analysis (jack-knife analysis based on world regions). Thus, the interaction effects between economic openness and veto points result from the association of democratic veto points with democracy. To conclude, veto points do not moderate the effects of trade and capital openness on climate performance in developing countries.

Is the effect of trade and capital openness moderated by political corruption? Trade openness has a significant negative effect on climate performance in countries with average levels of executive, legislative, and public sector corruption (see Figure 8.2.19). Its effects become stronger with legislative corruption, but weaker with executive and public sector corruption. When Latin American countries are removed from the analysis (see Figure 8.2.19), the negative effect of trade becomes also stronger with public sector corruption, as well as executive corruption. This implies that international trade undermines climate protection in countries with average levels of executive, legislative, and public sector corruption. The joint effect between trade openness and public sector corruption has been included in the final model and in further robustness analyses. The models with public sector corruption remain stable when additional controls are considered. The plot suggests a positive effect of capital openness in countries with very low levels of public sector corruption. This effect becomes insignificant in the jack-knife analysis. In sum, trade openness has a negative effect in countries with average levels of executive, legislative, and public sector corruption. The general political corruption index also considers judicial corruption. This study has focused on executive, legislative, and public sector corruption. However, the findings of the final model stay the same when it includes the joint effect of trade openness and judicial corruption or trade openness and political

corruption. There is no stable interaction between public sector corruption and capital openness. A separate analysis has already shown that the effect of capital openness is not conditional on executive or legislative corruption. The separate analysis of the regime-type approach has shown significant interaction effects of trade as well as capital openness with multiple democratic qualities and regime-type indicators. Are specific democratic qualities or regime type in general decisive for the effect of trade and capital openness? In contrast to the interaction between trade openness and established democracy, in simultaneous analysis the interaction between trade openness and electoral democracy stays significant in jack-knife analysis. There is a negative effect of trade openness on climate performance in non-electoral democracies (see Figures 8.2.20). By contrast, the analysis of democratic qualities shows that trade openness has a negative effect only in countries with average levels of vertical accountability/horizontal accountability/political and civil rights. These models have a higher explanatory power than the model with the interactions of trade and capital openness with electoral democracy (R^2=.6128, Adjusted R^2=.4025). The negative effect of trade openness becomes weaker with vertical accountability, horizontal accountability, and civil rights. When Pacific Asia or Sub-Saharan African countries are excluded from the analysis, it also becomes weaker with political rights. The interactions of trade openness with political and civil rights are stable in jack-knife analysis.[93] In addition, the explanatory power of the model with civil rights (R^2 = .7219, Adjusted. R^2 = .5926) is higher than the model with vertical accountability (R^2 = .6289, Adjusted R^2 = 4563), the model with horizontal accountability (R^2 = .6967, Adjusted R^2 = .4091), and the model with political rights (R^2 = .6650, Adjusted R^2 = .5092). As electoral democracy correlates highly with the democracy-quality dimensions, the results suggest that trade openness has a negative effect in countries with average levels of civil rights.

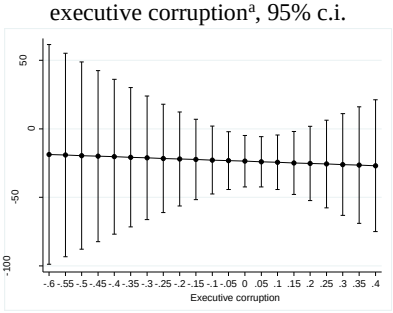
The plot suggests that the positive effect of capital openness becomes weaker with political rights. It is insignificant in countries with low levels of political rights. Interactions with vertical and horizontal accountability as well as political rights, however, become insignificant in the jack-knife analysis (based on world regions). There is a significant joint effect of capital openness with civil rights only. The positive effect of foreign direct investment becomes weaker with civil rights. It is negative with high civil-rights values. This interaction effect is significant at below-average and very extensive civil rights.

The joint effects of trade openness and civil rights, trade openness and public sector corruption, and capital openness and civil rights remain stable in the separate analysis of two subperiods (1992–1999 and 2000–2006) (see Chapter A8.3.5 in the annex). Chapter A8.3.4 in the annex tests the model assumptions. The results remain the same when democratic and autocratic sub-types are controlled, as well as when country-size, electoral types, climate commitment, and regional commitment are considered (see Figures A8.3.9 & A8.3.10). This also applies to the separate addition of controls to the regression models.

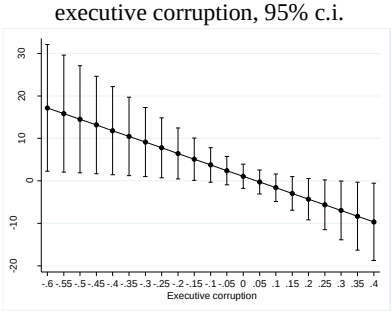
[93] When North African or Sub-Saharan African countries are excluded, the interaction between trade openness and vertical accountability has a negative effect for countries with slightly above-average values of vertical accountability. The interaction between checks and balances and trade openness in several jack-knife models is only significant for average or above-average values of horizontal accountability.

Figure 8.2.19 Comparison of political-corruption dimensions

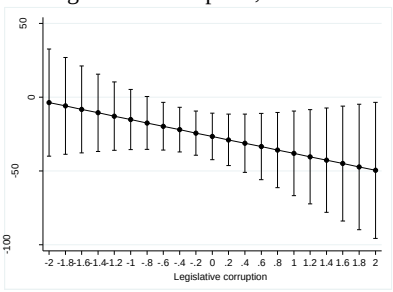
Trade openness by executive corruption[a], 95% c.i.



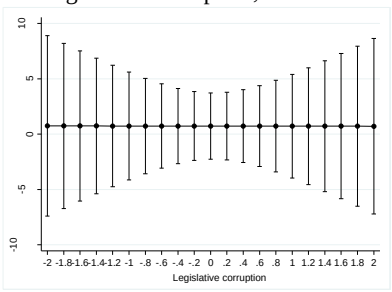
Capital openness by executive corruption, 95% c.i.



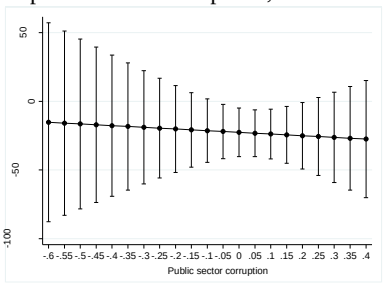
Trade openness by legislative corruption, 95% c.i.



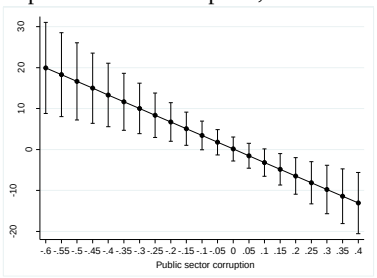
Capital openness by legislative corruption, 95% c.i.



Trade openess by public sector corruption[a], 95% c.i.



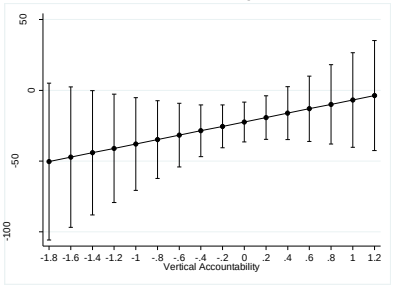
Capital openness by public sector corruption, 95% c.i.



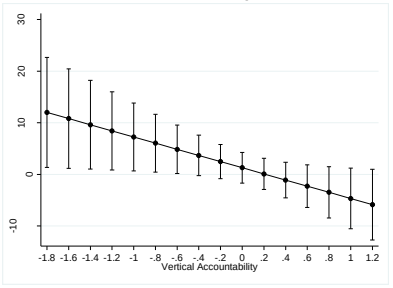
Notes: The interaction effects shown are based on simultaneous analysis of trade and capital openness with civil rights, presidential democracy and the respective political corruption dimension. The multivariate model controls ENGO strength, industry size, fossil fuel exports, economic development, economic growth, climate change vulnerability, policy diffusion, IGO memberships. [a] Analysis units = country averages from 1992-2006, N=64. This figure is based on the analysis of the sample without Pacific Asian countries. c.i. = confidence interval.

Figure 8.2.20 Comparison of democracy-quality dimensions

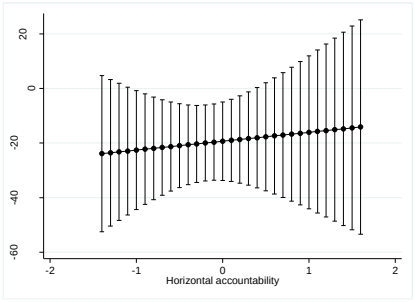
Trade openness by vertical accountability, 95% c.i.



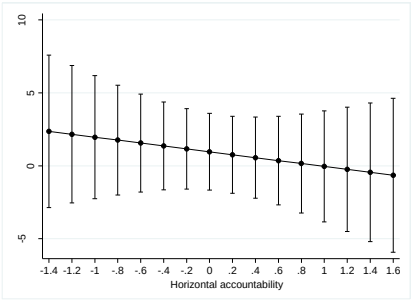
Capital openness by vertical accountability, 95% c.i.



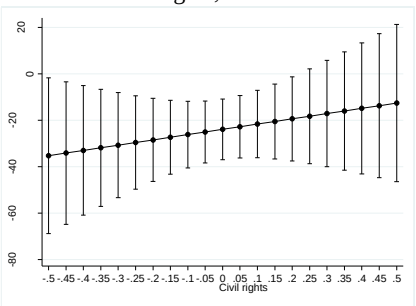
Trade openness by horizontal accountability[a], 95% c.i.



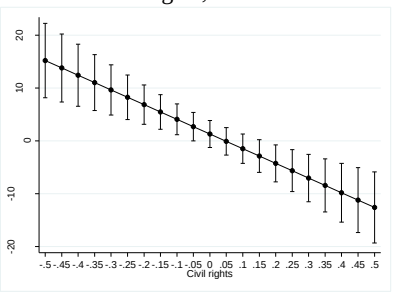
Capital openness by horizontal accountability, 90% c.i.



Trade openness by civil rights, 95% c.i.



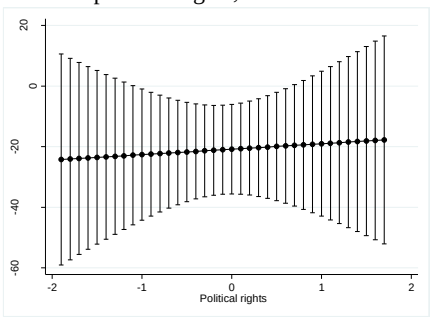
Capital openness by civil rights, 95% c.i.



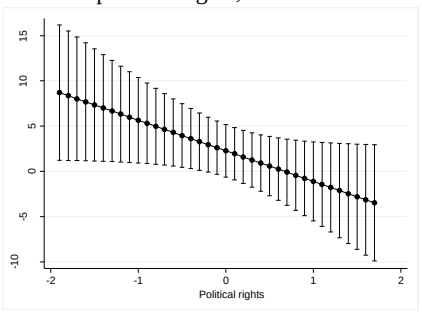
Notes: The interaction effects shown are based on simultaneous analysis of trade and capital openness with public sector corruption, presidential democracy and the respective democracy-quality dimension/ regime type indicator. The multivariate model controls ENGO strength, industry size, fossil fuel exports, economic development, economic growth, climate change vulnerability, policy diffusion, IGO memberships. [a] Analysis units = country averages from 1992-2006, N=64. This figure is based on the analysis of the sample without Pacific Asian countries.

Figure 8.2.20 Comparison of democracy-quality dimensions (continuation)

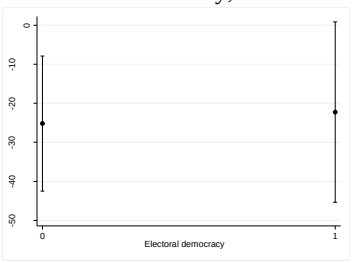
Trade openness by political rights, 95% c.i. [b]



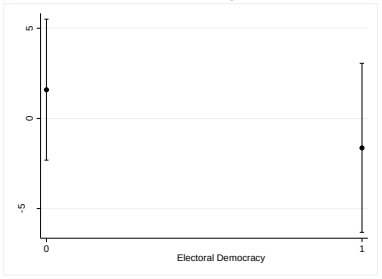
Capital openness by political rights, 95% c.i.



Trade openness by electoral democracy, 90% c.i.



Capital openenss by electoral democracy, 90% c.i.



Notes: The interaction effects shown are based on simultaneous analysis of trade and capital openness with public sector corruption, presidential democracy and the respective democracy quality-dimension/ regime type indicator. The multivariate model controls ENGO strength, industry size, fossil fuel exports, economic development, economic growth, climate change vulnerability, policy diffusion, IGO memberships. [b] Analysis units = country averages from 1992-2006, N=64. This figure is based on the analysis of the model without the interactions of trade and capital openness with presidential democracy of the sample without Pacific Asian countries. c.i. = confidence interval.

Table 8.2.5 presents the results of the final model with additional controls that have been found to be significant in the additive analysis in the previous section. The inclusion of the interactions of trade and capital openness with civil rights improves the explanatory power of the model significantly (F-test in change in R^2 = **). This does not apply to the joint effect of trade openness and public sector corruption. Among independent variables, trade openness is still the most important driver of climate performance (see standardised regression coefficients). It also has a substantial effect on the dependent variable, which varies (without China and South Africa) between about 60 and 100. Nonetheless, the joint effects of trade and capital openness with civil rights are also of relative importance for climate outcomes. The conclusions with regard to the controls remain the same: ENGO strength and urban population undermine climate performance. Plurality and mixed electoral rules are associated with higher-than-average emissions levels. In addition, the model with interaction effects also suggests that presidential democracies perform better than other democracies. This is also the case when semi-presidential democracies are controlled. The model assumptions have been tested for Model 4 in Table 8.2.5. There are no violations of normal distributions of residuals, homoscedasticity, no multicollinearity, and linearity. As previously explained, China and South Africa have been removed from the analysis of climate performance in developing countries. Using robust regressions, the joint effects of trade openness and civil rights, capital openness and civil rights, and trade openness and public sector corruption remain stable and significant when China and South Africa are included.

To conclude, globalisation affects climate performance in developing countries via economic openness. In accordance with Hypothesis $H_{int}1.3.2$, trade openness has a negative effect on climate performance. This negative effect becomes stronger with political corruption ($H_{xcorr}2a$). This interaction is significant for average levels of political corruption. It is independent of the form of political corruption. At the same time, trade openness has a significant negative effect on climate performance in countries with average levels of political and civil rights and vertical and horizontal accountability. Democratic qualities weaken the negative effect of trade openness. In accordance with the theoretical expectations ($H_{xdemocracy}3a$ & $H_{xdemocracy}4a$), the models with political and civil rights are stable. The model with civil rights can explain more cross-national variation than the other democratic-qualities models ($H_{xdemocracy}4b$). In contrast to hypothesis $H_{Int}2.3.2$, the additive models support no negative impact of capital openness. However, civil rights moderate the effect of capital openness on climate performance ($H_{xdemoracy}4b$). Foreign investment undermines climate performance in countries with extensive civil rights; it is associated with low levels of CO_2 emissions in countries with few civil rights.

Table 8.2.5 International integration, domestic political institutions, and climate performance in developing countries

	(1)	(2)	(3)	(4)
Economic development (ln)	1.871 *.211* (2.018)	1.996 *.225* (2.038)	2.391 *.269* (2.006)	1.882 *.212* (1.971)
Economic growth	.695 *.168* (.484)	.686 *.166* (.487)	.683 *.165* (.476)	.372 *.090* (.493)
Industry sector size (ln)	-4.659 *-.204* (4.170)	-4.603 *-.201* (4.195)	-5.575 *-.244* (4.139)	-4.105 *-.179* (4.104)
Fuel exports (ln)	-.624 *-.107* (.792)	-.544 *-.093* (.805)	-.652 *-.112* (.790)	-.493 *-.085* (.773)
ENGO strength (ln)	-3.231** *-.303*** (1.287)	-3.167** *-.297*** (1.298)	-3.898*** *-.366**** (1.336)	-3.768*** *-.354**** (1.302)
Urban population	-.174** *-.404*** (.082)	-.186** *-.432*** (.084)	-.187** *-.435*** (.082)	-.164** *-.381*** (.082)
Climate change vulnerability	7.961 *.101* (9.526)	8.234 *.104* (9.591)	9.957 *.126* (9.429)	9.904 *.125* (9.176)
Mixed electoral system	-6.422** *-.319*** (2.442)	-6.549** *-.325*** (2.464)	-6.787*** *-.337**** (2.413)	-5.990** *-.297*** (2.387)
Plurality electoral system	-4.468* *-.251** (2.545)	-4.934* *-.278** (2.651)	-4.717* *-.265** (2.595)	-3.128 *-.176* (2.666)
Presidential democracy	4.476* *.222** (2.647)	4.222 *.209* (2.689)	4.715* *.234** (2.644)	5.357** *.266*** (2.596)
Semi-presidential democracy	1.170 *.023* (5.225)	.512 *.010* (5.345)	-.638 *.010* (5.267)	-2.266 *-.045* (5.199)
Public sector corruption	10.33* *.247** (5.853)	11.01* *.263** (5.972)	10.54* *.252** (5.845)	7.646 *.183* (5.897)
Civil rights	7.354 *.182* (6.453)	8.205 *.203* (6.612)	7.105 *.176* (6.495)	6.347 *.157* (6.333)
Trade openness (lg)	-18.35** -.379** (7.154)	-18.59** *-.384*** (7.205)	-19.35*** *-.399**** (7.058)	-20.62*** *-.426**** (6.902)
Capital openness	2.186* *.218** (1.245)	2.220* *.221** (1.253)	1.910 *.190* (1.238)	1.776 *.177* (1.207)
Policy diffusion	.095 *.100* (.124)	.109 *.115* (.127)	.107 *.113* (.124)	.125 *.133* (.121)
IGO memberships	-.072 *-.119* (.090)	-.073 *-.120* (.091)	-.049 *-.081* (.090)	-.069 *-.114* (.088)
Trade openness x Public sector corruption		-18.88 *-.072* (27.85)	-51.63 *-.198* (33.03)	-52.31 *-.200* (32.14)
Trade openness x Civil rights			-52.26* *-.225* (29.83)	-36.26 *-.156* (30.27)
Capital openness x Civil rights				-11.62 *-.225* (6.241)
Constant	91.*63**** (16.16)	90.16*** (16.40)	89.09*** (16.05)	87.10*** (15.65)
R^2	.592	.596	.622	.651
R^2 Adjusted	.441	.435	.460	.488

Notes: The table displays unstandardised, standardised regression coefficients (in italics), and standard errors (in paratheses), *** p <.01, ** p <.05, N=64. Analysis units = country averages from 1992-2006.

8.3 Discussion of the results

This section discusses the statistical results in relation to the research question and hypotheses. Overall, the analysis supports the finding that globalisation affects climate performance differently in developed and developing countries. This chapter will therefore separate developed and developing countries. Table 8.3.1 summarises the results, in relation to the additive effects of globalisation dimensions on climate commitment and performance.

Table 8.3.1 Summary: The effect of globalisation on climate commitment and performance

	UNFCCC		Kyoto Protocol		Climate Performance	
	Pooled *Developing*		Pooled *Developing*		Developed *Developing*	
Trade openness	$H_{Int}1.1.1$	/	$H_{Int}1.2.1$	/	$H_{Int}1.3.1$	/
	$H_{Int}1.1.2$	/	$H_{Int}1.2.2$	/	$H_{Int}1.3.2$	-
Capital openness	$H_{Int}2.1.1$	/	$H_{Int}2.2.1$	/	$H_{Int}2.3.1$	/
	$H_{Int}2.1.2$	/	$H_{Int}2.2.2$	/	$H_{Int}2.3.2$	/ (-)
Economic interde-pendence	$H_{Int}3.1.1$	+ (/)/	$H_{Int}3.2.1$	+ (/)	$H_{Int}3.3.1$	+/-
	$H_{Int}3.1.2$	+ (/)	$H_{Int}3.2.2$	+ (/)	$H_{Int}3.3.2$	/
Political Globalisation	$H_{Int}4.1.1$	+	$H_{Int}4.2.1$	/ (+)	$H_{Int}4.3.1$	/ (+)
	$H_{Int}4.1.2$	+	$H_{Int}4.2.2$	/ (+)	$H_{Int}4.3.2$	/ (+)

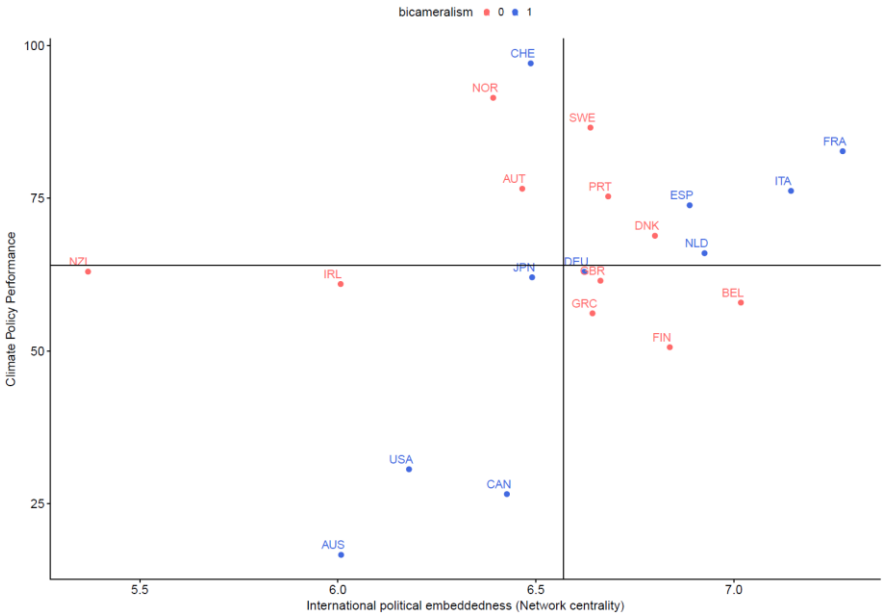
Notes: + positive effect, / no effect, - negative effect, +/- direction unclear. Green – empirical observed effect, red – theoretical expected effect that has not been supported by the empirical analysis.

8.3.1 Developed countries

As expected, economic globalisation affects climate performance via policy diffusion in developed countries ($H_{Int}3.3.1$). There is no effect of trade or capital openness on CO_2 emissions ($H_{Int}1.3.1$, $H_{Int}2.3.1$). In accordance with the theoretical expectations, the effect of policy diffusion is independent of domestic political institutions. Thus, the results support neither the veto-player nor the political-corruption approach. Moreover, economic interdependence is an important explanatory factor related to cross-national variation in climate performance among developed countries.

In contrast to the theoretical expectations, there is no additive positive effect of international political integration on climate performance ($H_{Int}4.3.1$). Network centrality, however, contributes to climate protection in bicameral systems (H_{xveto6}). Countries with bicameralism have below-average climate performance and network centrality or above-average climate performance and network centrality (see Figure 8.3.1). France, Italy, the Netherlands, and Spain are bicameral systems with above-average climate-protection values. Germany and Switzerland, also bicameral systems, barely deviate from this pattern. Among federal states, Australia, Canada, Japan, and the US perform badly in climate performance and share below-average network-centrality values. In countries with bicameralism, network centrality has a positive effect on climate performance.

Figure 8.3.1 International political integration, bicameralism, and climate performance in developed countries



Notes: Analysis units = country averages from 1992-2006, N=21. Countries with bicameralism are blue. All others are red. The vertical and horizontal lines = average values of international political integration and climate performance.

The statistical analysis suggests that international political integration contributes to climate performance only in bicameral systems. Desai (2002, p. 376) deduces from case studies that international pressures, such as European integration, have been very important to environmental policy in general. Countries with above-average network centrality and climate performance are bicameral systems, and EU members (Spain, Netherlands, Italy, and France) (see Figure 8.3.1). Countries with below-average network centrality and climate performance, as well as bicameralism, are not EU-members (Australia, Canada, and the United States). Australia, Canada, and the US are, in general, less politically integrated (Brown, 2012, p. 325). Several of these countries are also federal systems (e.g., Australia, Canada, Germany, and the United States). It could, therefore, be an interaction between political globalisation and EU integration and bicameralism. However, no support for this relationship can be found in the data.

One explanation for this finding is that bicameralism and federalism imply that there are more actors involved in the domestic political decision-making process who are influenced by incentives derived from political globalisation than would be the case in unicameral states. Comparative climate policy research on differences in climate performance between EU countries and the US supports this conclusion. State participation in IGOs implies co-operation between sub-national policymakers as well as public officials (Schreurs et al., 2009, p. 181). Local and regional political authorities and public officials from the US and Europe can, therefore, exchange their experience, knowledge, and policy preferences in meetings within the UN system and other IGOs (Selin & VanDeveer, 2012, p. 360). For instance, Schreurs et al. (2009, p. 177) have argued that, despite the lack of US government climate change mitigation policies, federal states and cities have introduced climate policies influenced by European climate change policies. Selin and VanDeveer (2012, p. 360) have observed that networks of political decision-makers at different political levels in Europe and the US have contributed to the adoption of climate policies in US federal states and cities; these resemble European responses to climate change. European climate policies are affected by climate-policy ideas discussed by the US Congress (Selin & VanDeveer, 2012, p. 360). Brown (2012, p. 330) has argued that 'competitive federalism is not enough, but it is also better than nothing.' Federal systems in the EU enable cooperation among environmental supporters from local, regional, national, and EU levels (Brown, 2012, p. 329).

However, the result is driven by a small number of countries. Differences between Australia, Canada, the US, and other developed countries must be considered. In addition to bicameralism, the former three countries share federalism and low levels of international political integration; in comparison to European countries, they have cheap gasoline prices, energy dependence on oil and coal, and low levels of population density (Brown, 2012, p. 325; Christoff & Eckersley, 2011, p. 438). Moreover, Australia and Canada are the most important exporters of natural resources among the developed countries (Brown, 2012, p. 325; Christoff & Eckersley, 2011, p. 438). Case studies suggest that the effect of federalism depends on other factors, such as responsibility for natural-resource extraction, whether states or provinces support environmental protection (Desai, 2002, p. 373). Desai (2002, p. 374) assumes that conflicts between the federal and state governments in federal systems with weak federal government and plurality electoral rule, tend to focus on economic growth and are dependent on states with natural-resource extraction. States and provinces that depend on natural-resource extraction have little interest in climate change mitigation. Regional governments in Australia support natural-resource extraction because they depend on it financially (Desai, 2002; Walker, 2002). In Australia and Canada, states and provinces control natural-resource extraction. There are conflicts related to environmental protection between regional governments and federal governments in Canada and Australia (Toner, 2002; Walker, 2002). Australian states are unwilling to act against the policy preferences of important economic actors, even if they are responsible for environmental policy (Desai, 2002; Walker, 2002). The multivariate analysis shows that the interaction effect remains stable when we control for country size and fossil-fuel exports and consider population density.

8.3.2 Developing countries

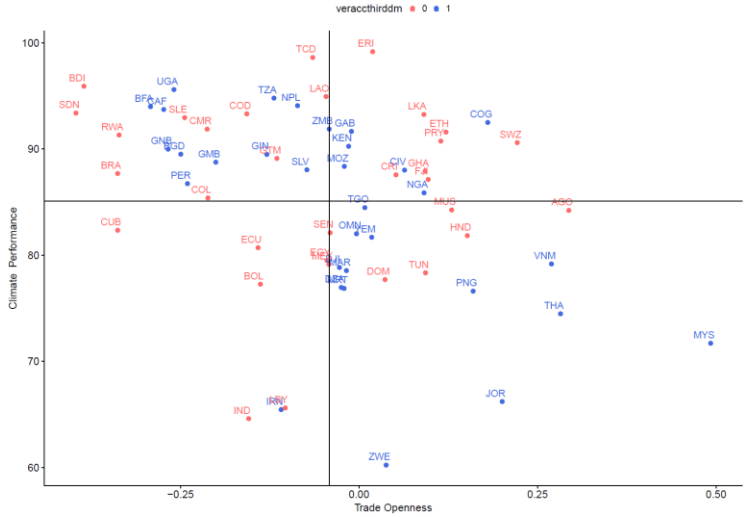
In accordance with the hypotheses, economic globalisation affects the climate performance of developing countries via economic openness. In accordance with $H_{Int}3.3.2$, there is no significant effect of policy diffusion on developing countries. As expected, trade openness is associated with low levels of climate performance ($H_{Int}1.3.2$). In contrast to hypothesis $H_{Int}2.3.2$, capital openness has an effect on climate performance only when its interrelationship with civil rights is taken into account (see below).

The empirical analysis offers little support for the veto-player approach. The findings confirm hypotheses associated with the political-corruption approach. The effect of international trade is significant only in countries with average levels of political corruption (analysis without Latin American countries). The analysis suggests that the negative effect of international trade becomes stronger with political corruption. The effect is independent of the form of political corruption (executive, legislative, and public sector corruption). This supports the hypothesis that corruption worsens the negative effect of economic openness in developing countries ($H_{xcorr}4b$). The corruption of political decision-makers and public officials makes politicians unlikely to address global warming and enables firms and citizens to avoid environmental regulations. However, the statistical results indicate that trade openness

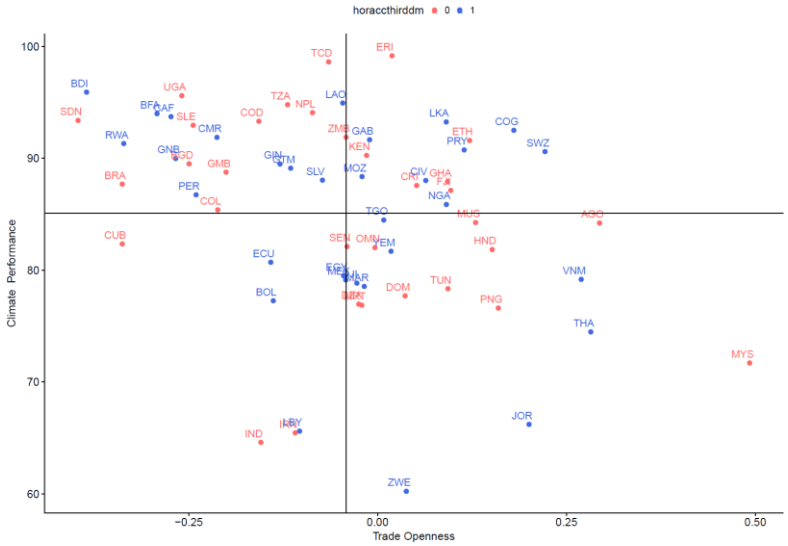
has no significant effect in countries with very high levels of political corruption. This is in line with hypothesis $H_{corr}4a$. It confirms the observation that political corruption hinders economic growth and contributes to lower scale effects of international trade. However, it is important to note that the joint effect of trade openness and aspects of political corruption contribute little to explaining differences in climate performance among developing economies.

Figure 8.3.2 Trade openness, democracy qualities, and climate performance in developing countries

Vertical accountability



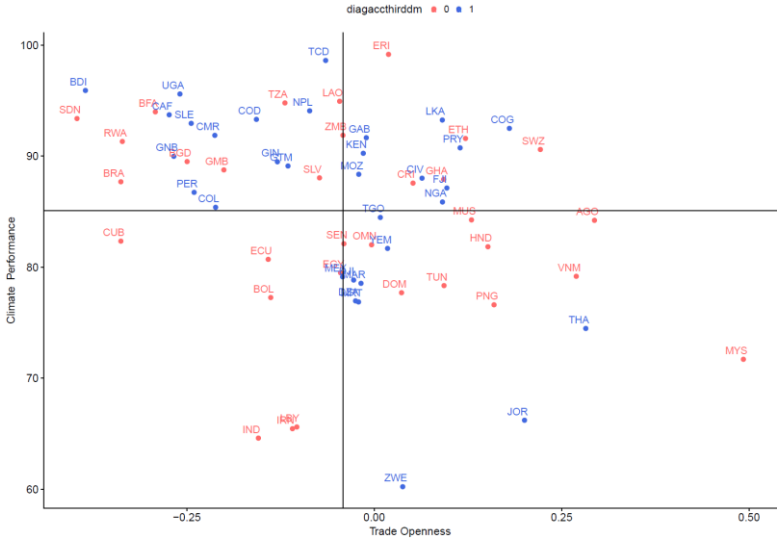
Horizontal accountability



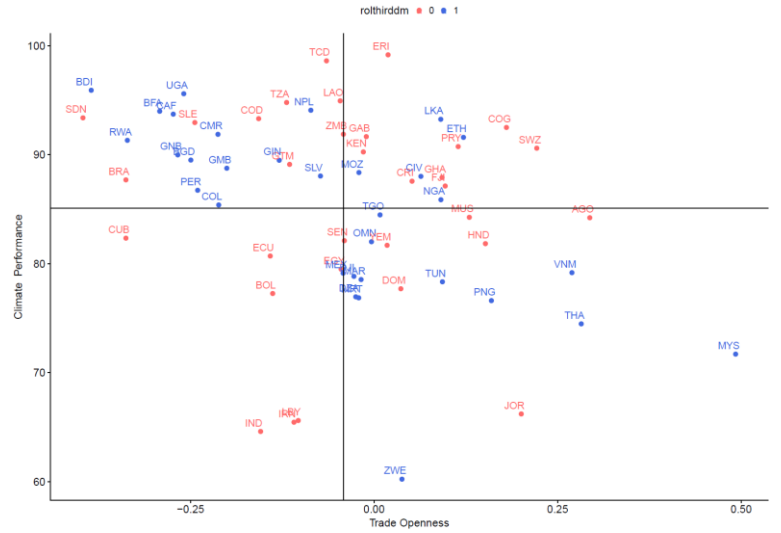
Notes: Analysis units = country averages from 1992-2006, N=64. The 50% of countries that are in the middle of the distribution of political and civil rights, vertical and horizontal accountability are blue. All others are red. The vertical and horizontal lines = average values of international economic integration and climate performance.

Figure 8.3.2 Trade openness, democracy qualities and climate performance in developing countries (continuation)

Political rights



Civil rights



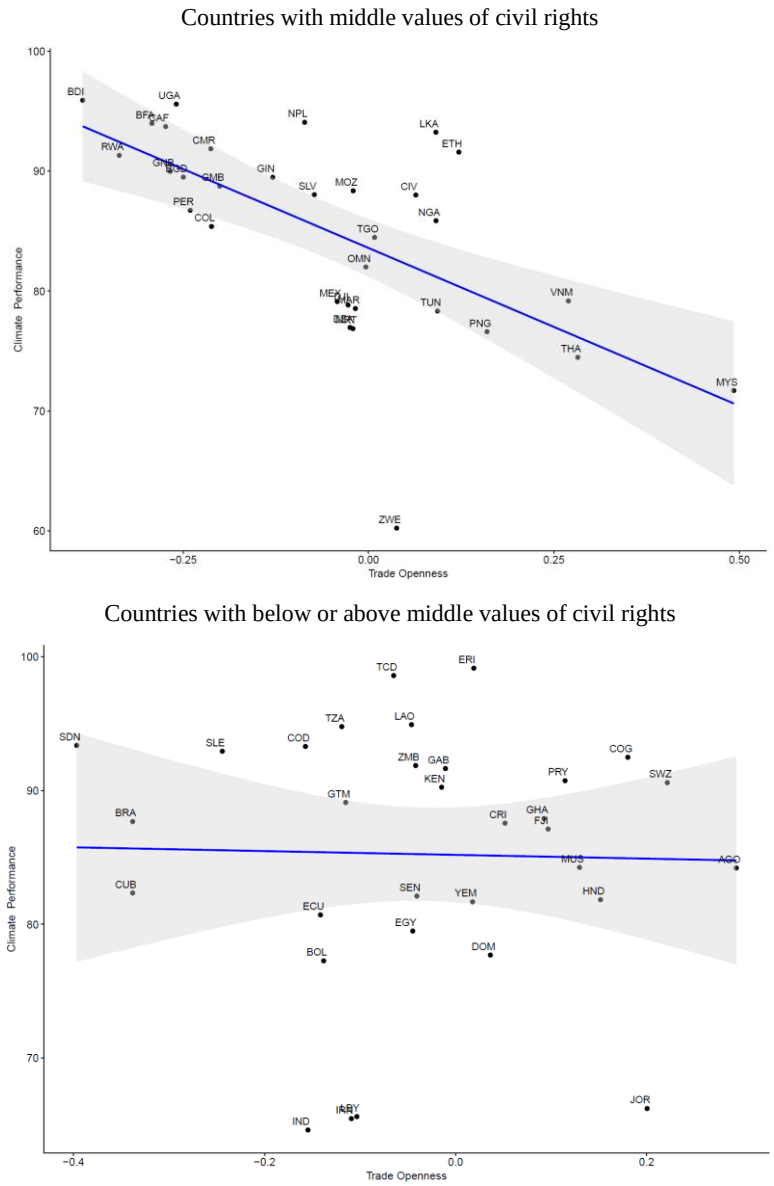
Notes: Analysis units = country averages from 1992-2006, N=64. The 50% of countries that are in the middle of the distribution of political and civil rights, vertical and horizontal accountability are blue. All others are red. The vertical and horizontal lines = average values of international economic integration and climate performance.

Democratic qualities affect the relationship between economic openness and climate performance. The results of this study suggest that political and civil rights and vertical and horizontal accountability weaken the negative effect of international trade on climate performance. The latter two interactions, however, are unstable. The results indicate that civil rights are decisive for the relationship between trade openness and climate performance. Based on a visual inspection of bivariate scatter plots (Figure 8.3.2) and explanatory power, the interaction effect is clearest in relation to civil rights. In accordance with the theoretical expectations of this study, it is not regime type in general, but specific democratic qualities that lessen the negative effect of international trade on CO_2 emissions. This may explain why Spilker (2013) finds no interaction between the regime type captured by summary measures of democracy quality and trade openness in relation to CO_2 emissions. In her analysis of the joint effect of trade openness and regime type on SO_2 and CO_2 emissions in developing countries, Spilker (2013) finds support for this hypothesis for SO_2 but not CO_2 emissions.

Figure 8.3.2 shows that the interaction between civil rights and trade openness applies only to countries with average civil-rights values. The 50% of countries in the middle of the civil-rights distribution exhibit a clear negative effect of trade openness in comparison to other countries (Figure 8.3.3). Above-average civil-rights values are not associated with a negative effect of trade openness. For instance, Ecuador, Bolivia and India are

characterised by below-average values of trade openness and above-average civil-rights values, but they do not perform well in climate protection. A similar pattern can be present for vertical and horizontal accountability, as well as political rights. However, the latter cannot describe the relationship between trade openness and climate performance as well as civil rights. This applies especially to the model with horizontal accountability.

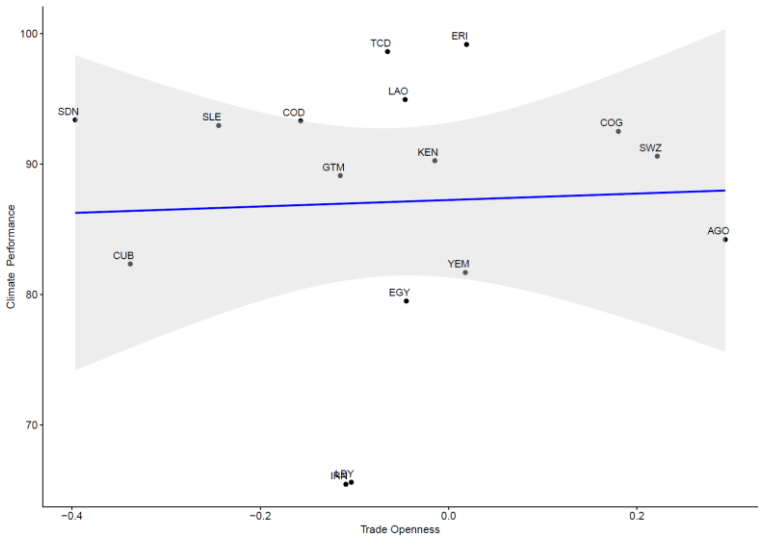
Figure 8.3.3 Trade openness, civil rights, and climate performance in developing countries



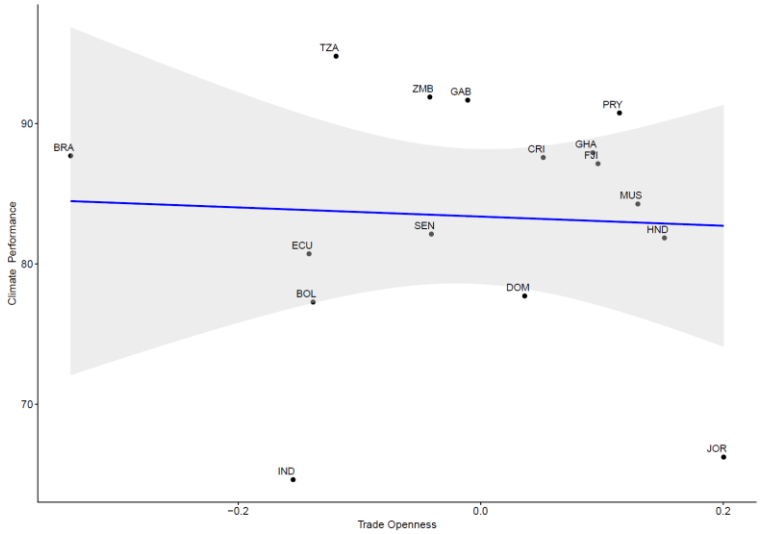
Notes: Analysis units = country averages from 1992-2006, N=64. Blue lines = bivariate linear regression of the relationship between trade openness and climate performance. Grey area = 95% confidence interval. The vertical and horizontal lines = average values of international economic integration and climate performance.

Figure 8.3.3 Trade openness, civil rights, and climate performance in developing countries (continuation)

Countries with below middle levels of civil rights



Countries with above middle levels of civil rights



Notes: Analysis units = country averages from 1992-2006, N=64. Blue lines = bivariate linear regression of the relationship between trade openness and climate performance. Grey area = 95% confidence interval. The vertical and horizontal lines = average values of international economic integration and climate performance.

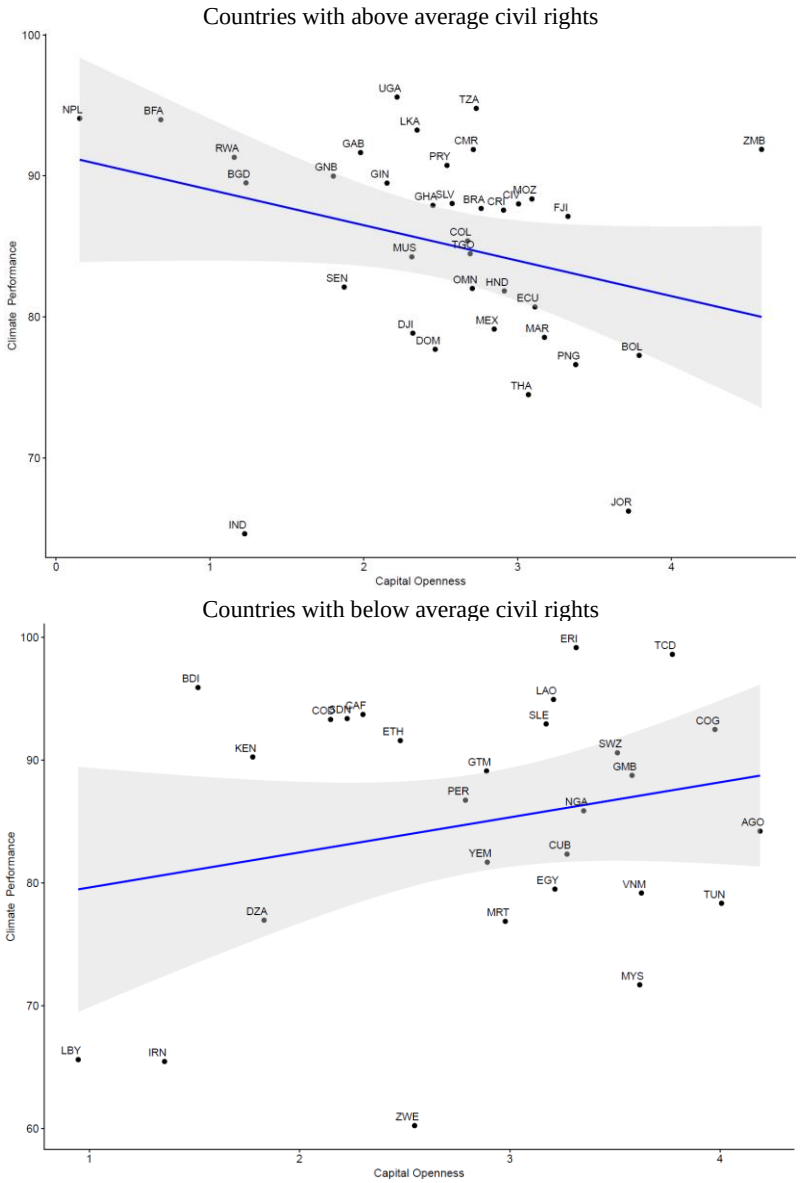
The present results suggest that aspects of regime type also moderate the effect of trade openness on CO_2 emissions. However, civil rights are more important for the moderation effect of democracy.[94] The analysis suggests that trade openness has a negative effect in countries with average levels of civil rights, while its effect becomes weaker with civil rights. This is in line with the literature, which shows that democracy has positive effects on the environment only when there are stable political institutions and a developed civil society and (e.g., Fredriksson & Neumayer, 2016; Gallagher & Thacker, 2008; see Chapter 4). Accordingly, Keefer (2007) has shown that public-goods provision is lower in young democracies because of 'the inability of political competitors in young democracies to make credible, pre-electoral promises to voters' (Keefer, 2007, p. 804).

While there has been no stable effect of capital openness on the additive analysis of climate performance, its effect on CO_2 emissions varies with civil rights. In accordance with hypothesis $H_{xdemocracy}4b$, there is a negative effect of capital openness in countries with extensive civil rights. By contrast, foreign investment contributes to climate performance in countries with few civil rights. Figure 8.3.4 shows that most countries with above-average civil-rights values have either below-average values of capital openness and above-average values of climate

[94] Differences in research design must be considered. The present analysis has focused on cross-national variation. Spilker (2013) pooled countries over time.

performance or above-average values of capital openness and below-average values of climate performance. This finding confirms the democracy-FDI literature, which suggests that civil rights make countries more attractive for foreign investment. Civil rights, including the rule of law, enable large-scale investments. They thus contribute to global air pollution via the scale of economic activity.

Figure 8.3.4 Capital openness, civil rights, and climate performance in developing countries



Notes: Analysis units = country averages from 1992-2006, N=64. Blue lines = bivariate linear regression of the relationship between capital openness and climate performance. Grey area = 95% confidence interval Vertical and horizontal lines = average values of international economic integration and climate performance.

This result differs from the argument made by similar studies (e.g., Spilker, 2013). Accordingly, the previous section discussed Bolivia in detail to examine the causal relationship between civil rights, capital openness, and climate performance. The scatter plot shows that Bolivia is characterised by above-average levels of civil rights and foreign investment, as well as below-average climate performance. Bolivia became a democracy in the 1980s. There have been further improvements in democracy quality, including the rule of law during the 1990s (BTI, 2003, p. 2). Bolivia has performed well in civil rights, including the rule of law, since the 1990s (BTI, 2003, p. 6). State-led companies were privatised from the middle of the 1980s until 2001 (BTI, 2006, p. 17). Privatisations also took place in the energy sector (BTI, 2006, p. 4). The privatisation of state-led companies in the 1990s led to an increase in FDI inflows to Bolivia (Flexner, 2000). In 1998, Bolivia became the largest receiver of FDI, as a percentage of GDP, in Latin America (Flexner, 2000). FDI flows in Latin America play a considerable part in the pollution-intensive economic sector (Blanco et al., 2013, p. 106). In Bolivia, FDI inflows in the 1990s went mainly to the business and hydrocarbon sectors, i.e. oil and gas exploration (Flexner, 2000). Blanco et al. (2013) have

shown that FDI in pollution-intensive sectors contributes more to CO_2 emissions in Latin America than FDI flows to other economic sectors. Following the foreign investment, there has been a considerable increase in exports during the research period and beyond. It is plausible to expect that this has contributed to an increase in CO_2 emissions in Bolivia. In sum, the case of Bolivia shows that civil rights attract FDI, which contributes via scale effects to global air pollution.

8.4 Conclusions

This chapter contributes to the literature on globalisation and climate performance by showing how the effect of various globalisation dimensions depends on domestic political institutions. To this end, it has used a statistical analysis to test the hypotheses of three explanatory approaches to the joint influence of globalisation dimensions and domestic political institutions: the veto-player approach, the political-corruption approach, and (in the analysis of developing countries) the regime-type approach. The findings suggest that climate performance in developed countries depends on the climate performance of important trading partners. This effect is independent of domestic political institutions. There is no support for the hypothesis that the veto-player or political-corruption approaches can explain the relationship between policy diffusion and climate performance. An analysis of developed countries, however, suggests that there is a positive effect of state centrality in IGO networks on climate performance in bicameral systems. This effect is, in a pairwise comparison, the most important driver of climate outcomes. In addition to these relationships, the statistical analysis supports non-political drivers of climate performance in high-income countries. As expected, economic development, corporatism, and population density contribute to climate performance, while economic growth, fuel exports, and country size undermine it.

In accordance with the hypotheses, international integration affects climate outcomes in developing economies in different ways. Among various globalisation dimensions, only economic openness is associated with climate performance in developing countries. In accordance with the political-corruption approach, political corruption worsens the negative effect of international trade. This interaction effect is independent of the form of political corruption. However, it contributes little to explaining differences in climate outcomes among developing countries. It adds to previous research, which has found that civil rights, in particular, weaken the negative effect of international trade in countries with average levels of this democracy quality. Capital openness contributes to climate performance in countries with below-average civil-rights values, but undermines climate performance in countries with above-average civil-rights values. These democratic freedoms increase the scale effects of international trade on CO_2 emissions by attracting foreign investment. This relationship is exemplified by Bolivia. Among various controls, ENGO strength and urban population undermine climate performance. In the developing world, political institutions have additional additive effects on climate outcomes. Plurality and mixed electoral rules are associated with higher-than-average emissions levels. Presidential democracies perform better than other democracies.

References

Armingeon, Klaus, Christian Isler, David Weisstanner, and Laura Knöpfel. 2015. Supplement to the comparative political data set – Government composition 1960-2013. Bern: Institute of Political Science, University of Berne. http://www.cpds-data.org/index.php/data, Accessed 5 Jul 2016.

Babones, Salvatore J. 2014. Methods for quantitative macro-comparative research. Los Angeles et al.: Sage.

Beck, Nathaniel. 2001. Time-series–cross-section data: What have we learned in the past few years? *Annual Review of Political Science* 4(1):271–293.

Bättig, Michèle B., and Bernauer, Thomas. 2009. National institutions and global public goods: Are democracies more cooperative in climate change policy? *International Organization* 63(2):281-308.

Bernauer, Thomas, Tobias Böhmelt, and Vally Koubi. 2013. National ENGOs registered in a country from Thomas, Bernauer, Tobias Böhmelt, and, Vally Koubi. 2013- The democracy – civil society paradox in global environmental governance. *Global Environmental Politics* 13(1):888-107. http://www.ib.ethz.ch/data/civilsoc.html. Accessed 7 May 2016.

Blanco, Luisa, Fidel Gonzalez, and Isabel Ruiz. 2013. The impact of FDI on CO_2 emissions in Latin America. *Oxford Development Studies* 41(1):104–121.

Bohlken, Anjali Thomas. 2011. Time series cross section data. http://blogs.ubc.ca/poli574/files/2011/05/TSCS_mylecturenotes2.pdf. Accessed 15 Oct 2017.

Brown, Douglas M. 2012. Comparative climate change policy and federalism: An overview. *Review of Policy Research* 29(3):322–333.

BTI (Transformationindex Bertelsmann). 2003. Bolivia country report. https://www.bti-project.org/fileadmin/files/BTI/Downloads/Reports/2003/pdf/BTI_2003_Bolivia.pdf. Accessed 18 Jan 2019.

BTI (Transformationindex Bertelsmann). 2006. Bolivia country report. https://www.bti-project.org/fileadmin/files/BTI/Downloads/Reports/2006/pdf/BTI_2006_Bolivia.pdf. Accessed 18 Jan 2019.

Cheibub, José Antonio, Jennifer Gandhi, and James Raymond Vreeland. 2009. Democracy and Dictatorship Revisited Dataset 2009 (v.1). https://sites.google.com/site/joseantoniocheibub/¬datasets/democracy-and-dictatorship-revisited. Assessed 1 Aug 2017.

Cheibub, José Antonio, Jennifer Gandhi, and James Raymond Vreeland. 2010. Democracy and dictatorship revisited. *Public Choice* 143(1-2):67–101.

Christoff, Peter, and Robyn Eckersley. 2011. Comparing state responses. In *Oxford handbook of climate change and society*, eds. John S. Dryzek, Richard B. Norgaard, and David Schlosberg, 431–448. Oxford et al.: Oxford University Press.

Coppedge, M., J. Gerring, S. Lindberg, S. Skaaning, S., Jan Teorell, David Altman, et al. 2017. VDem[country-year/country-date] Dataset v7.1. Varieties of Democracy (V-Dem) Project. https://www.v-dem.net/en/data/data-version-7-1. Accessed 28 Nov 2018.

Cruz, Cesi, Philip Keefer, and Carlos Scartascini. 2016. Database of political institutions dataset, 2015 update (DPI2015). Updated version of Beck, Thorsten, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh. 2001. New tools in comparative political economy: The database of political institutions. *World Bank Economic Review* 15(1):165-176. Washington, D.C.: Inter-American Development Bank. http://www.iadb.org/en/research-and-data/publication-details,3169.html?pub_id=IDB-DB-121. Accessed 18 May 2016.

Desai, Uday. 2002. Institutional profiles and policy performance: Summary and conclusion. In *Environmental politics and policy in industrialized countries*, ed. Uday Desai, 357–381. Cambridge (MA) & London: The MIT Press.

Flexner, Nikolai. 2000. Foreign direct investment and economic growth in Bolivia, 1990-1998. Accessed in https://econwpa.ub.uni-muenchen.de/econ-wp/mac/papers/0309/0309009.pdf, 18.01.2019.

Fredriksson, Per G., and Eric Neumayer. 2016. Corruption and climate change policies: Do the bad old days matter? In *Environmental and Resource Economics* 63(2):451–469.

Freedom House. 2015. Freedom of the world. http://www.freedomhouse.org/report/freedom-world-aggregate-and-subcategory-scores. In *Quality of Government Standard Dataset, version Jan16*, eds. Jan Teorell, Stefan Dahlberg, Sören Holmberg, Bo Rothstein, Anna Khomenko, and Jakob Svensson. Göteburg: The University of Gothenburg: The Quality of Government Institute. http://qog.pol.gu.se/data/datadownloads/qogstandarddata. Accessed 1 Jan 2016.

Gallagher, Kevin P., and Strom C. Thacker. 2008. Democracy, income, and environmental quality. Amherst: Political Economy Research Institute. University of Massachusetts. (Working Paper Series 164).

Hanusch, Frederic. 2018. Democracy and climate change. London & New York: Routledge.

Hathaway, Oona A. 2008. Treaties' end: The past, present, and future of international lawmaking in the United States. Yale Law Journal 117:1236–1372.

Henisz, Witold J. 2002. The institutional environment for infrastructure investment. *Industrial and Corporate Change* 11(2):355–389.

Hildebrandt, Achim, Sebastian Jäckle, Frieder Wolf, and Andreas Heindl. 2015. Methodologie, Methoden, Forschungsdesign. Wiesbaden: Springer Fachmedien Wiesbaden.

IASA (International Institute for Applied Systems Analysis) 2004. 13 IIASA-POP World regions, definition. http://webarchive.iiasa.ac.at/Research/POP/proj01/countries.html. Accessed 10 Sep 2016.

Jahn, Detlef. 2010. The veto player approach in macro-comparative politics: Concepts and measurement. In *Reform processes and policy change*, eds. Thomas König, Marc Debus, and George Tsebelis, 43–68. New York, NY: Springer.

Jahn, Detlef. 2013. Einführung in die vergleichende Politikwissenschaft. 2. Auflage. Wiesbaden: Springer VS.

Keefer, Philip. 2007. Clientelism, credibility, and the policy choices of young democracies. *American Journal of Political Science* 51(4):804–821.

Kittel, Bernhard. 2005. Pooled Analysis in der ländervergleichenden Forschung: Probleme und Potenziale. In *Vergleichen in der Politikwissenschaft*, eds. Sabine Kropp, and Michael Minkenberg, 96–115. Wiesbaden: VS Verlag für Sozialwissenschaften.

Kittel, Bernhard, and Hannes Winner. 2005. How reliable is pooled analysis in political economy? The globalization-welfare state nexus revisited. *European Journal of Political Research* 44(2):269–293.

Lijphart, Arend. 1971. Comparative politics and the comparative method. *American Political Science Review* 65(3):682–693.

Lührmann, Anna, Kyle L. Marquardt, and Valeriya Mechkova 2017. Constraining governments: New indices of vertical, horizontal and diagonal accountability. Gothenburg; University of Gothenburg. The Varieties of Democracy Institute & Department of Political Science. (Working Paper 46).

Marshall, Monty G., Ted Robert Gurr, and Keith Jaggers. 2015. Polity IV project. Political regime characteristics and transitions, 1800-2015. Dataset users' manual. Center for Systemic Peace (Polity IV dataset version 2015). http://www.systemicpeace.org/inscrdata.html. Accessed 6 Jul 2016.

McMann, Kelly, Daniel Pemstein, Brigitte Seim, Jan Teorell, and Staffan I. Lindberg. 2016. Strategies of validation: Assessing the varieties of democracy corruption data. University of Gothenburg. Göteburg: The Varieties of Democracy Institute & Department of Political Science. (Working Paper 23).

Pemstein, Daniel., Kyle L. Marquardt, Eitan Tzelgov, Yi-ting Wang, Joshua Krusell, and Farhard Miri. 2017. V-Dem measurement model: Latent variable analysis for cross-national and cross-temporal expert-coded data. Gothenburg: Varieties of Democracy Institute. (Working Paper 21, 2nd ed.).

Pevehouse, Jon C., Timothy Nordstrom, and Kevin Warnke. 2010. The COW-2 international organizations dataset version 2.3. Conflict management and peace science (21), S. 101-119. http://www.correlatesofwar.org/data-sets/IGOs. Accessed 7 May 2016.

Plümper, Thomas, Vera E. Troeger, and Philip Manow. 2005. Panel data analysis in comparative politics: Linking method to theory. *European Journal of Political Research* 44(2):327–354.

Podestà, Frederico. 2002. Recent developments in quantitative comparative methodology: The case of pooled time series cross-section analysis. (DSS Papers SOC 3).

Roller, Edeltraud. 2005. The performance of democracies. Political institutions and public policies. Oxford: Oxford University Press.

Schreurs, Miranda A., Henrik Selin, and Stacy D. VanDeveer. 2009. Conflict and cooperation in transatlantic climate politics: Different stories at different levels. In *Transatlantic environment and energy politics. Comparative and international perspectives*, eds. Miranda A. Schreurs, Henrik Selin, and Stacy D. VanDeveer, 165–185. Surrey & Burlington: Ashgate.

Selin, Henrik, and Stacy D. VanDeveer. 2012. Federalism, multilevel governance, and climate change politics across the Atlantic. In *Comparative environmental politics. Theory, practice, and prospects*, eds. Paul F. Steinberg, and Stacy D. VanDeveer, 341–368. Cambridge (MA) & London: The MIT Press.

Siaroff, Alan. 1999. Corporatism in 24 industrial democracies: Meaning and measurement. *European Journal of Political Research* 36:175–205.

Spilker, Gabriele. 2013. Globalization, political institutions and the environment in developing countries. New York, London: Routledge.

Swank, Duane. 2013. Comparative political parties dataset: Electoral, legislative, and government strength of political parties by ideological group in 21 capitalist democracies, 1950-2011. Electronic database, department of political science, Marquette University. http://www.marquette.edu/polisci/faculty_swank.shtml. Accessed 1 Aug 2016.

Teorell, Jan, Stefan Dahlberg, Sören Holmberg, Bo Rothstein, Anna Khomenko, and Richard Svensson. 2016. Quality of government standard dataset, version Jan16: University of Gothenburg: The Quality of Government Institute. http://qog.pol.gu.se/data/datadownloads/qogstandarddata. Accessed 1 Jun 2016.

The World Bank Group. 2016a. CO_2 emissions (metric tons per capita). http://data.worldbank.org/indicator/EN.ATM.CO2E.PC. Accessed 01 Jan 2016.

The World Bank Group. 2016b. Trade (% of GDP). http://data.worldbank.org/indicator/NE.TRD.GNFS.ZS. Accessed 7 May 2016.

The World Bank Group. 2016c. Industry (including construction), value added (% of GDP). https://data.worldbank.org/indicator/NV.IND.TOTL.ZS. Accessed 17 Nov 2016.

The World Bank Group. 2016d. Fuel exports (% of merchandise exports). https://data.worldbank.org/indicator/TX.VAL.FUEL.ZS.UN. Accessed 17 Nov 2016.

The World Bank Group. 2016e. GDP per capita, PPP (constant 2011 international $). Last updated 22.07.2016. http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.KD. Accessed 6 Aug 2016.

The World Bank Group. 2016f. Urban population (% of total). Accessed in https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS. Accessed 17 Nov 2016.

The World Bank Group. 2017a. GDP growth (annual %). http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG. Accessed 15 Jun 2017.

The World Bank Group. 2017b. Population density (people per sq. km of land area). Accessed in https://data.worldbank.org/indicator/EN.POP.DNST, 01.06.2017.

The World Bank Group. 2017c. Population growth (annual %). https://data.worldbank.org/indicator/sp.pop.grow. Accessed 1 Jun 2017.

Toner, Glen. 2002. Contesting the green: Canadian environmental policy at the turn of the century. In *Environmental politics and policy in industrialized countries*, ed. Uday Desai, 71–120. Cambridge (MA) & London: The MIT Press.

United Nations [UN] Comtrade. 2017. UN comtrade database. https://comtrade.un.org/. Accessed 18 Feb 2017.

United Nations Conference on Trade and Development. UNCTAT. 2015. Foreign direct investment: Inward and outward flows and stock, annual, 1980-2014 (World Investment Report 2015: Reforming International Investment Governance). http://unctad.org/en/Pages/statistics.aspx. Accessed 5 Aug 2016.

Urban, Dieter, and Jochen Mayerl. 2011. Regressionsanalyse: Theorie, Technik und Anwendung. 4., überarbeitte und erweiterte Auflage. Wiesbaden: VS Verlag für Sozialwissenschaften.

von Stein, Jana. no year. Data from the international law and politics of climate change. http://www.janavonstein.org/data.html. Accessed 9 Aug 2016.

Walker, K.[95] J. 2002. Environmental policy in Australia. *Environmental politics and policy in industrialized countries*, ed. Uday Desai, 249–293. Cambridge (MA) & London: The MIT Press.

Wolf, Frieder. 2015. Regressionsanalyse gepoolter Zeitreihen. In *Methodologie, Methoden, Forschungsdesign*, eds. Achim Hildebrandt, Sebastian Jäckle, Frieder Wolf, and Andreas Heindl, 109–132. Wiesbaden: Springer Fachmedien.

You, Jong-sung, and Sanjeev Khagram. 2005. A comparative study of inequality and corruption. American Sociological Review 70:136–157.

[95] The complete first name is not mentioned.

9 Conclusion

Abstract

This book adds to the academic literature that domestic political institutions moderate, apart from the relationship between economic interdependence and climate performance (in developed countries), the effects of economic and political globalisation on climate commitment and performance. This chapter concludes the present study. It compares the findings described in previous chapters on the joint effect of globalisation and domestic political institutions on climate commitment and performance. It then evaluates the implications and limitations of these results for future research. This work concludes by reflecting upon possible policy implications.

The climate change crisis is one of the greatest challenges of our time. To tackle global warming, it is important to understand country differences in state participation in international climate cooperation. Climate cooperation implies that states commit to common goals and principles (climate commitment) and implement policy measures to realise these goals (climate performance). A central question in comparative and global-environmental politics is whether globalisation is good or bad for climate commitment and performance. From a policy perspective, it is of particular importance to establish the extent to which domestic political factors moderate the globalisation/climate change relationship. For instance, with regard to economic globalisation, policymakers and interest groups frequently use competition concerns to impede the ratification of climate agreements and the adoption of policies to reduce greenhouse gas emissions. In contrast to the broader literature on the consequences of globalisation, there has been little research on whether effects of globalisation on climate commitment and performance depend on domestic politics. To fill this research gap, the present study has examined whether domestic political institutions moderate the effects of international economic and political integration. To this end, it has applied three theoretical approaches to the joint effect of international integration and domestic political institutions in the broader globalisation literature: the veto-player, political-corruption and the regime-type approaches. The veto-player approach assumes that the policy preferences of veto players and veto points moderate state responses to globalisation. The other two approaches identify aspects of institutional quality (political corruption and democracy) as crucial.

Previous quantitative studies have not systematically examined the possible moderation effects of domestic political institutions, based on the assumption that competitive pressures caused by economic globalisation affect government behaviour in climate policy, independent of domestic politics. From a theoretical perspective, multiple moderation effects of institutional variables on climate commitment and performance can be assumed. Domestic political institutional variables not only moderate government responses to international incentives and pressures, they also affect the impact of exposure to international influences on climate commitment and performance. Domestic political institutions involved in implementing climate policies moderate the effect of globalisation on climate performance. Finally, domestic political institutions moderate (as context conditions of international trade and investment) the effect of economic openness on climate outcomes via economic growth.

The present study of data on climate commitment and climate performance from 1992-2006 has shown that political globalisation contributes to the ratification of soft and hard international climate treaties. In the developed world, economic globalisation influences climate performance via policy diffusion among trading partners. In developing countries, economic openness is crucial. Trade and capital openness undermine climate outcomes in poor countries. This analysis adds to the academic literature that domestic political institutions moderate, apart from the relationship between economic interdependence and climate performance (in developed countries), the effects of economic and political globalisation on climate commitment and performance. While competition pressures caused by economic globalisation affect climate performance in developed countries, independent of domestic variables, institutional constraints and institutional quality still moderate the effect of incentives derived from involvement in IGOs on climate commitment and performance, as well as context conditions of international trade and capital scale effects of economic openness on climate outcomes. Left- and right-wing veto players care about economic competitiveness. The same applies to corrupt and incorrupt political decision-makers. The policy preferences of veto players in the left/right dimension do also not affect the effects of the other globalisation dimensions on climate commitment and performance. However, institutional constraints and institutional quality make a difference in the relationship between political globalisation and climate commitment and performance. Aspects of institutional quality – political corruption and democracy quality – influence climate policy consequences of economic openness in the developing world. Overall, the results show that institutional constraints and institutional quality can strengthen positive and weaken negative effects of globalisation on climate commitment and

performance. The results support hypotheses based on political-corruption and regime-type approaches. By contrast, there is little support for the veto-player approach.
The first section (9.1) of this final chapter compares the findings related to climate commitment and performance The following section (9.2) discusses the contributions that this study makes to the literature, as well as possible future research questions. Section 9.3 explains the limitations of this study. The final section focuses on policy implications.

9.1 Comparison of climate commitment and performance

Chapter 2 specifies the dependent variables as commitment to the central goals and principles of the international UN climate change regime (climate commitment) and the implementation of measures that contribute to its central goal: the stabilisation of greenhouse gas emissions (climate performance). Together, both dependent variables constitute state participation in climate cooperation within the UN framework. This study measures climate commitment by the delay in ratifying the two climate treaties that fall within the research period (1992–2006) – UNFCCC and Kyoto Protocol. Climate performance is captured by data on CO_2 emissions. Previous studies of the joint effect of globalisation and domestic political institutions have focused on climate performance. To date, there has been no similar publication on climate commitment. However, climate cooperation requires states to agree on common goals and principles *and* implement policy measures to implement them. It is therefore important to study the way in which globalisation affects climate commitment.
The comparison of the two dimensions is also relevant. The moderation effects of domestic political institutions may be more prevalent for climate commitment and performance. From a theoretical perspective, it is easier for countries to act in accordance with positive incentives derived from political globalisation and to ratify climate treaties than it is for them to mitigate climate change. The ratification of international climate agreements is associated with lower costs than climate protection. Moreover, the issue visibility of ratification behaviour is higher. It is harder for citizens and ENGOs to monitor the consequences of globalisation on climate policy outcomes than on climate commitment. For the same reason, it might be easier for governments to not reduce greenhouse gas emissions in accordance with pressures from economic globalisation. It is therefore crucial to study whether domestic political institutional factors influence effects on climate commitment *and* performance.
This study began by showing that globalisation matters for both dimensions of state participation in climate cooperation. Table 9.1 summarises the main findings. However, the comparison of climate commitment and performance reveals important differences. When we focus on the relative importance of the dimensions of globalisation, the statistical findings support the globalisation/environment literature by indicating that international integration affects climate commitment and performance in different ways. Political globalisation implies positive incentives for states to enter into climate treaties and to mitigate climate change. The results support the claim that IGO involvement contributes to the ratification of climate treaties. However, it only matters for climate performance in bicameral developed countries. It is easier for governments to act in accordance with incentives derived from IGOs in their participation in climate treaties. Climate commitment does not necessarily imply that countries actually implement policy measures to reduce greenhouse gas emissions.
Policymakers use economic competition concerns to question participation in climate treaties *and* the adoption of climate policies. However, international economic integration contributes only to explaining country differences in climate performance. Economic globalisation influences climate policy outcomes via competitive pressures caused by economic openness and interdependence (policy diffusion), as well as via the scale and composition effects of economic openness. In line with expectations, the statistical findings show that economic interdependence is crucial for climate performance in developed countries, and that economic openness undermines climate performance in poor countries. Case studies have shown that economic interdependence influenced the Kyoto Protocol ratification of some countries. However, there is no general association between economic globalisation and climate commitment across countries. To conclude, the importance of economic and political globalisation varies for climate commitment and performance. While political globalisation contributes to climate commitment, it supports climate performance only in bicameral developed countries. By contrast, economic globalisation affects only climate performance.
The results of this study also suggest that globalisation effects on the ratification of climate treaties and on climate performance are, with one exception,[96] moderated by domestic political institutions. Aspects of institutional quality are crucial. Only policy diffusion among trading partners affects climate outcomes in developed countries, independent of domestic political institutions. The analysis of climate commitment and performance reveals that the policy preferences of veto players – captured by government ideology and ideological heterogeneity on the left-dimension – do not moderate the influence of international integration. Thus, left- and right-wing veto players

[96] The relationship between economic interdependence and climate performance is independent of the institutional variables considered in this study.

respond in similar ways to incentives and pressures caused by globalisation during the ratification of climate treaties and in relation to climate protection.

The theoretical discussion suggests that domestic political institutions have more influence on the globalisation/climate commitment relationship than international-integration consequences for climate performance. This is because the issue visibility of ratification behaviour is higher than that of climate-policy implementation. Accordingly, the statistical findings show that the effect of policy diffusion among trading partners on climate performance in the developed world does not vary in accordance with institutional variables. The present findings, however, indicate that institutional variables matter to the effects of other globalisation dimensions on climate commitment *and* performance.

While domestic political institutions moderate the influence of globalisation on climate commitment and performance, moderation effects vary between the two dimensions. On the one hand, different institutional variables matter to some extent. First, in accordance with previous research, political corruption strengthens the negative effects of trade openness on CO_2 emissions in developing countries. However, it makes no difference to the relationship between political globalisation and climate commitment. IGO involvement contributes to the ratification of climate treaties, irrespective of corrupt governments and parliaments. Second, only the analysis of climate outcomes finds support for the veto-player approach, with the joint effect of political globalisation and bicameralism. The policy preferences of veto players *and* veto points do not moderate the effects of globalisation on climate commitment. On the other hand, among institutional drivers, democracy quality matters for both aspects of climate cooperation. There is no evidence, however, that it only leads to climate-friendly consequences of international integration. Civil rights strengthen the positive effects of IGO involvement on Kyoto Protocol ratification and lessen the negative effects of trade openness. Simultaneously, in contrast to their democratic counterparts, only autocratic governments ratify soft climate treaties in accordance with incentives derived from political globalisation. Capital openness undermines climate performance in developing economies with above-average levels of civil rights. Overall, institutional quality moderates the effects of IGO involvement and economic openness on climate commitment and performance. Specific moderation effects vary between climate commitment and performance, as well as between developed and developing countries and with treaty design.

To conclude, globalisation matters for climate commitment and performance. Political globalisation contributes to the ratification of climate treaties and climate performance in developed countries only. Economic globalisation is important for climate outcomes only. Institutional variables moderate the effects of international integration on ratification behaviour and climate outcomes. Only the relationship between economic interdependence and climate performance in developed countries is independent of institutional constraints and institutional quality. For both dimensions of state participation in climate cooperation, aspects of institutional quality and, in particular, democracy quality are decisive for globalisation influences. By contrast, the policy preferences of veto players in the left/right dimension do not influence state responses to globalisation in relation to climate commitment and performance.

Table 9.1 Main findings

	Climate Commitment		**Climate Performance**
	UNFCCC	Kyoto Protocol	
	All countries	All countries	Developed *Developing*
Trade openness	/	/	/ *- in countries with average levels of political corruption and average levels of civil rights*
Capital openness	/	/	/ *- in countries with above average levels of civil rights*
Policy diffusion	/	/	+/- /
International political integration	/	/	+ in bicameral systems
	+ in non-electoral democracies	*+ in countries with above average levels of civil rights*	/

Notes: + positive effect, / no effect, - negative effect, +/- unclear direction.

9.2 Contributions to the literature

This section discusses the contributions made by this study and its findings to the literature, and their implications for future research. The two sections focus on contributions to comparative climate policy research and to general globalisation and policy-diffusion research.

9.2.1 Comparative climate policy research

Comparative climate policy research investigates domestic and international factors that explain climate policy output and outcomes, including climate commitment and performance. In contrast to the broader literature on the consequences of globalisation, there has been no systematic research on moderation effects of domestic political institutions in comparative climate policy research. To fill this research gap, the present study has applied three perspectives on the joint effect of globalisation and domestic political institutions on climate commitment and performance: the veto-player approach, the political-corruption approach, and the regime-type approach. Previous research has not compared multiple explanatory approaches. The veto-player approach is the most elaborate theoretical approach to study the joint effect of international and domestic explanatory factors. The analysis shows that the veto-player approach cannot explain the relationship between globalisation and climate commitment and performance. It finds support for the political-corruption and regime-type approaches. The comparison of the three explanatory approaches suggests that the policy preferences of veto players and institutional constraints on the government (the policy preferences of veto players and veto points) do not explain state responses to globalisation. The policy preferences of the government in the left/right dimension make no difference at all to the effect of globalisation on climate commitment and performance. The regime type and a country's acceptance of the rule of law (civil rights) affect a country's exposure to the positive incentives of international political integration. Moreover, civil rights and political corruption undermine climate performance via scale effects of international trade and investment. Thus, aspects of institutional quality matter for the influence of globalisation. Future research could investigate the importance of additional aspects of institutional quality, such as government effectiveness. Overall, it is important to consider multiple explanatory approaches when analysing the joint effects of globalisation and domestic political institutions. The following section discusses the results for each explanatory approach in detail.

Among the three explanatory approaches, the findings offer little support for the veto-player approach. This applies to the analysis of climate commitment and performance. This is in line with the argument in Chapter 5 that left- and right-wing parties react in similar ways to international pressures in relation to climate policy. In this respect, the research period from 1992–2006 must be considered. More recently, in the developed and developing world, there has been a polarisation of positions on global warming in the left/right dimension. It applies especially to Europe and the United States but also to developing countries. Right-wing populists and right-wing populist parties, in contrast to mainstream right- and left-wing parties, uniformly reject climate cooperation and climate change mitigation (Lockwood, 2018, p. 712). Moreover, they question global warming (Lockwood, 2018, p. 712). Examples include the Trump administration in the United States, the Brazilian government of Jair Bolsonaro, and right-wing populist parties in Europe (e.g., AfD in Germany and the Front National in France). Right-wing populist governments have also eliminated some climate-protection policies in Hungary, Poland, and the United States, among other countries (Lockwood, 2018, p. 712). These findings are therefore restricted to the research period. Future research could analyse whether the left/right dimension has become more important for government responses to globalisation, with regard to climate policy. In addition, the green/growth dimension has been not examined here, due to a lack of available data. It is reasonable to expect it to influence globalisation effects on climate commitment and performance. This issue should be considered in future research.

The findings offer support for the political-corruption approach. In accordance with previous research, political corruption contributes to the negative effects of trade openness on climate performance in the developing world. As expected, it is not important for climate outcomes in developed countries. Developing countries share higher levels of political corruption. These results also support the implicit assumption of previous research that political corruption in general is decisive, as opposed to specific political-corruption dimensions. This study has added to the existing research in finding no similar interaction with capital openness. The political-corruption approach does not apply either to incentives and pressures caused by policy diffusion or to those caused by IGO involvement. Corrupt and non-corrupt governments react in similar ways to policy diffusion and political globalisation. There is likewise no support for the hypothesis that political corruption moderates the effect of globalisation on climate commitment.

Finally, the results confirm hypotheses of the regime-type approach in the pooled analysis of climate commitment, as well as the analysis of the climate performance of developing countries. In contrast to earlier research, which focused on regime type, this study has shown that a separate analysis of democracy-quality dimensions can contribute to a better understanding of the relationship between globalisation and climate commitment and

performance. In this respect, there are differences between climate commitment and performance. Regime-type and democratic qualities moderate the effect of international political integration on climate commitment, while democratic qualities moderate the effect of economic openness on climate performance in developing countries. This confirms hypotheses and statistical results showing that political globalisation contributes to climate commitment and economic openness undermines climate performance in developing countries only. With regard to climate commitment, the moderation effects vary between UNFCCC and Kyoto Protocol ratification. While there are differences between democracies and autocracies with regard to the effect of international political integration on UNFCCC ratification, only civil rights strengthen the positive effect of IGO involvement on Kyoto Protocol ratification. In developing countries, there is a negative effect of trade openness on climate performance in countries with average civil rights. Moreover, capital openness has a negative effect on climate performance in countries with above-average civil rights. In sum, it is important to consider regime type and specific democratic qualities to understand the environmental consequences of globalisation. Further studies could study the moderation effects of democratic qualities on climate performance in developed countries and consider other democracy-quality dimensions, such as equal access to political power among social groups and democracy quality at the local and regional level.

The findings on the joint effect of regime type and international political integration on climate commitment also add to the literature on treaty design and state participation in international treaties. This literature assumes that treaty design matters to state participation in international treaties. Previous empirical research has supported this theoretical expectation. The current results shows that interaction effects also vary in accordance with treaty design. This contributes to the literature on treaty design and international cooperation. Further research should ask whether domestic and international factors, which explain ratification behaviour, and their interaction effects vary in accordance with treaty design. The finding that IGO involvement contributes to UNFCCC ratification in autocracies supports the literature on human-rights treaties.

There are several pathways for future research. As Chapter 2 explains, moderation effects between globalisation and domestic political institutions vary between domestic and global environmental problems. Political decision-makers may have more incentives to reduce the negative consequences of globalisation on the local environment. It is therefore relevant to compare the effect of interactions between globalisation and domestic political institutions on different environmental policies. Spilker (2013) has found that the positive effect of trade openness on SO_2 emissions in developing countries is weaker in countries that are more democratic. She has found no similar effect on CO_2 emissions. The present results have shown that civil rights, not democracy quality in general, weaken the negative effects of trade openness on climate performance. Future research should examine whether this is a general difference between domestic and global pollution. Cao and Prakash (2012) have shown that veto players moderate the effect of international economic interdependence on domestic air and water pollution. My own analysis of climate commitment and performance finds no support for the veto-player approach. With regard to economic interdependence, this confirms the argument that left- and right-wing veto players react in similar ways to international economic pressures, particularly in the case of global air pollution. CO_2 emissions result from economic processes and have no immediate local consequences. Therefore, the veto-player approach may apply to local pollutants but not to global pollutants. It is important to study these differences in more detail. Future research should analyse the joint effect of capital openness and civil rights. The example of Bolivia shown that civil rights can make FDI in natural-resource extraction more attractive, thus contributing to higher emission levels. For instance, it is relevant to study potential differences among types of foreign direct investment.

Finally, this study has focused on domestic political institutions, reflecting the available data. While it has considered both institutional constraints and institutional quality, it is also important to consider the policy preferences of political actors. Within the veto-player approach, the policy preferences of political actors have to some extent been taken into account.

9.2.2 Globalisation and policy-diffusion literature

This study makes two contributions to the broader literature on the joint effects of globalisation and domestic political institutions on the environment. First, it underlines the importance of examining multiple globalisation dimensions when analysing the moderation effects of domestic political institutions. Previous research has focused on domestic pollution. Such studies have argued that, in relation to climate policy, governments react in similar ways to international pressures to stay internationally competitive, since global warming has no immediate effect on citizens. In contrast to these studies, the present analysis considers multiple dimensions of globalisation: economic openness, interdependence, and international political embeddedness. The main argument is that, while countries respond in similar ways to international economic pressures to stay economically competitive, domestic political institutions can moderate the effects of economic openness via economic growth and incentives derived from international political integration. This study has added to the literature by showing that, while domestic political institutions do not influence policy diffusion via trading partners, they moderate the effect of international political integration, as well as trade and capital openness. The findings suggest that the effect of international

economic interdependence, which is decisive for country differences in climate performance in developed countries, is independent of veto players and political corruption. By contrast, regime type moderates the effect of international political integration on climate commitment. Moreover, regime type and political corruption improve our understanding of the effect of economic openness on climate performance in developing countries. In this respect, the case study of Bolivia shows that the same mechanism can contribute to the positive effects of international political integration on climate commitment, strengthening the negative effects of economic openness on climate performance. The present findings, therefore, underline the importance of considering multiple globalisations when researching the joint effect of domestic and international factors that may explain other policy outputs and outcomes.

Second, this study has shown that a disaggregated analysis of domestic political institutions contributes to a better understanding of the effects of globalisation. Using as explanatory models the veto-player, political-corruption, and regime-type approaches, I argue that there are multiple possible moderation effects of domestic political institutions on the influence of globalisation. Second, forms of political corruption and democracy-quality dimensions vary in their moderation effects. With regard to the veto-player approach, it has shown that, among veto points, only bicameralism is important for the relationship between globalisation and climate performance in developed countries. With regard to the political-corruption approach, corrupt and incorrupt governments react in similar ways to political globalisation. However, political corruption worsens the negative effects of trade and capital openness. In contrast to earlier research findings, this effect is independent of the form of political corruption. The present findings also add to the literature on the regime-type approach. For the Kyoto Protocol, in contrast to the UNFCCC, there is no difference in international political effects on the ratification behaviour of democracies and autocracies. Yet, civil rights strengthen positive incentives derived from international political integration. In accordance with the findings of Spilker (2013), economic openness does not have a different effect on climate performance in developing democracies and autocracies. However, this study has shown that specific democratic qualities moderate the effect of trade and capital openness on CO_2 emissions. The disaggregated analysis of the moderation effects of domestic political institutions can, therefore, help us to better understand the climate-policy consequences of globalisation. This confirms the finding that the disaggregated analysis of regime type helps to explain the consequences of democracy in relation to climate commitment and performance (Escher & Walter-Rogg, 2018). The disaggregated approach can also help us better understand the joint effect of domestic political institutions and globalisation on other environmental, social, and economic policy outputs and outcomes. For instance, previous research has shown that democracy moderates the effect of economic globalisation on social policy outputs and outcome. It may be fruitful to examine which democratic qualities are decisive.

9.3 Limitations of this study

This chapter discusses the limitations of this study and their implications for future research. The results depend on research design and model specification. In this respect, they are restricted to specific country samples and one research period (1992–2006). Future research should study these relationships in more recent years. As the previous section explains, with regard to the veto-player approach, the importance of veto players and their policy preferences may have become more important during the last decade, in relation to the influence of globalisation on climate commitment and performance. Many comparative climate-policy studies are limited to a specific research period. It is, therefore, important to improve the data available for further studies. My developed-country sample is nearly complete, based on the selection criteria. However, data availability issues have made it necessary to drop some countries from the developing and pooled country sample. As explained in chapter 6, I have not examined climate performance in post-communist countries. This partly reflects the lack of data on the policy preferences of veto players outside the developed world. To improve our knowledge, there is a need for better data.

My findings refer to the conceptualisation and measurement of the dependent variables. This implies that these conclusions on climate commitment refer to the ratification duration of the UNFCCC and Kyoto Protocol. Chapter 2 explains that ratification behaviour only reflects the acceptance of an international consensus. Moreover, my findings suggest that states ratify international climate agreements to enhance their reputations at the international level. Thus, ratification behaviour tells us little about a country's actual willingness to contribute to climate change mitigation. It is therefore necessary for future research to develop new measures for the analysis of climate commitment via large N-studies. There is a particular need for data based on expert evaluations, which can address the complexity of commitment to climate cooperation.

With regard to climate performance, this study has examined CO_2 emissions levels. These results do not necessarily apply to other greenhouse gases. Moreover, as Chapter 2 explains, I have focused on between-variation country averages over the research period. Thus, the findings of this study do not refer to the development of CO_2 emissions within countries. For both theoretical and empirical reasons, it is important to examine between- and within-variation data separately (see also Hanusch, 2018, p. 251). I have focused on between-variation data, as

political institutions vary little over time. Future research should analyse the relationship between globalisation, domestic political institutions, and changes in CO_2 emissions. It should also be noted that the dependent variable focuses on emissions derived from production within countries. This is in line with previous research. Yet, as Chapter 2 argues, developed countries may perform better because they shift pollution-intensive production processes to the developing world. Likewise, global air pollution in the developing world derives from the production of goods that are exported to industrialised countries.

In addition, this study of climate commitment and performance focuses on national climate policy (see also Hanusch, 2018, p. 252). There is a need to study transnational, regional, and domestic climate commitment and performance as well. Climate policy takes place at all levels of the political system (see also Selin & VanDeveer, 2012, p. 342; Winslow, 2005, p. 771). Cities and regions undertake international coordination efforts and are active in climate change mitigation. Therefore, the effect of globalisation and its interplay with domestic political institutions might vary among cities and regions.

The results show that conceptualisation matters for the effect of international economic integration on climate commitment and performance. The moderation effects of domestic political institutions vary between trade and capital openness, as well as policy diffusion via trading partners. This confirms the argument in policy-diffusion research that it is important to consider multiple conceptualisations of policy diffusion. In this regard, the findings also suggest that, in relation to climate commitment, policy diffusion within regions, rather than via trading partners, is decisive. The statistical analysis of interaction effects between domestic and international variables has focused on policy diffusion via important trading partners. Consequently, future research should consider alternative approaches to measuring this policy-diffusion mechanism (for instance, the measurement approach proposed by Cao & Prakash, 2010), as well as other policy-diffusion mechanisms.

With regard to political globalisation, this study has focused on state involvement in IGOs. In particular, the constructivist approach also considers other dimensions of political globalisation, such as INGOs. It is necessary to supplement the present findings with an analysis of additional dimensions of political globalisation. Finally, this study has followed previous research in focusing on economic and political globalisation. It may be fruitful to study interactions between other dimensions of globalisation and domestic factors as well – for instance, whether the effects on the global environment of aspects of social globalisation, such as tourism, vary in accordance with domestic political institutions.

As Section 9.1 explains, the findings suggest that the veto-player approach cannot explain climate-policy responses to international economic and political integration. Given the available data, there has been little variance among indicators of the ideological heterogeneity of veto players and specific veto points in the developing-country and pooled-country samples. Thus, the statistical power of these variables is low. The separate analysis of climate performance in developed countries came to the same conclusion: that the policy preferences of veto players and veto points do not help us understand the effects of globalisation. The results remained stable using the ideological heterogeneity measure developed by Jahn (2010), which is based on actual policy preferences. Nonetheless, there is a need for valid and reliable data on the policy preferences of veto players in developing countries.

The explanatory models specified in Chapter 5 show that there are multiple relevant moderation effects of domestic political institutions on the influence of domestic political institutions. In accordance with previous research on globalisation and climate commitment and performance, this study has applied a quantitative research design. With better data, it may be possible in future to consider multiple interrelationships with structural equation modelling in large-N analyses as well. The short case studies complement the quantitative analyses, helping to explain the causal mechanisms underpinning these findings. To improve our knowledge on the causal relationships between international and domestic explanatory factors of climate cooperation, it would be helpful to shift use process tracing.

9.4 Policy implications of the research findings

There has been a considerable increase in in globalisation for the last decades (Gale, 2019, p. 517). Simultaneously, high levels of deforestation, biodiversity loss, ocean pollution and (global) air pollution can be observed (Gale, 2019, p. 517). An important question, in global environmental politics, is, therefore, whether globalisation is good or bad for our (global) environment. According to Frankel and Rose (2005, p. 85), when international trade contributes to environmental degradation, independent of other factors, there is little public demand to reduce globalisation to protect the environment. This study has shown that domestic political institutions moderate, apart from the relationship between economic interdependence and climate performance, effects of globalisation on climate commitment and performance. This implies that domestic politics is able to strengthen positive effects and weaken negative effects of globalisation on climate cooperation. In this respect, the results offer multiple political and practical implications.

According to Barrett (2003, see also Bang et al., 2016), the effectiveness of climate treaties depends on three conditions: broad participation, acceptance of ambitious greenhouse gas emission reductions by its member states,

and that members states reduce their emissions in accordance with these emission targets. With regard to climate commitment, supports of climate cooperation should consider the interplay between political globalisation and regime type aspects. The effectiveness of the Kyoto Protocol has been undermined by the non-participation of important greenhouse gas emitters (Canada, USA). The results confirm the conclusion from previous research that it is important to support involvement in IGOs as it contributes to climate treaty ratification. This study shows that regime type aspects strengthen this relationship. In this respect it is important to distinguish between soft and hard climate treaties. Scholars and policymakers discuss the design of international climate treaties to increase state participation in climate cooperation. The results of this study suggest that treaty design influences the joint effect of international political integration and regime type aspects on climate commitment. International political integration contributes to the participation of autocracies in soft climate treaties. Thus, when the aim is broad country participation among non-democratic countries, soft climate treaties are preferable. By contrast, state involvement in IGOs or IGO networks is associated only with the ratification of harder climate treaties (Kyoto Protocol) in countries with above-average civil rights. Thus, acceptance of the rule of law at the domestic and international level contributes to the ratification of more ambitious climate agreements. To increase state participation in such climate treaties, it is important to support the rule of law and international cooperation in developed and developing countries. In accordance with this finding, it can be observed that opponents of climate change mitigation (e.g., the Trump administration) reject multilateral cooperation in general and simultaneously undermine the rule of law at the domestic level. The current Paris Agreement is a relative ambitious climate treaty (Bang et al., 2016, p. 212). However, it does not include legally binding greenhouse gas emission reduction targets. Nonetheless, the rejection of international cooperation and the rule of law by the US administration has led to its withdrawal from the Paris Agreement.

As described above, the effectiveness of climate agreements depends on their compliance with international climate targets. With regard to climate performance in developed countries, the findings imply that a country's climate performance depends on the climate performance of its main trading partners. This relationship is independent of institutional constraints, the policy preferences of veto players, and political corruption. When a country's trading partners share low levels of CO_2 emissions, this country is likely to achieve high levels of climate performance. This finding underlines the importance of coordinating greenhouse gas emissions reductions among developed countries. To improve climate protection in countries that perform badly, governments should undertake more efforts to coordinate their climate policies with the respective policies of their trading partners. More recently, major developed countries have stopped supporting climate Therefore (i.e., the US). This may undermine climate policies in connected countries. Moreover supporters of climate protection, should take the lead in climate change mitigation. For instance, the trade relationship between China and the EU has contributed to stricter environmental regulations in China.

The finding, that trade and investment are negatively associated with climate performance in countries with average or above-average levels of civil rights, suggests that international economic integration has not contributed to sustainable development in the developing world. This underlies the importance of supporting green growth strategies in developing countries. However, the analysis suggests that trade and capital openness are not necessarily associated with lower climate performance in developing countries. The analysis of developing countries indicates that civil rights lessen the negative effects of trade openness on climate performance in developing countries. This implies that policy-makers should support the rule of law to contribute to climate protection. This is in accordance with the argument that improvements in institutional quality are necessary to reduce negative effects of globalisation (Fukumi & Nishijima, 2010, p. 1873). Simultaneously, these liberties undermine climate performance via scale effects of increased foreign investment. Thus, it is important that policy-makers support green-growth strategies in foreign investment. To solve the climate crisis, it is also important to consider further the environmental consequences of free-trade agreements. These findings help to illuminate the fear that the EU trade agreement with MERCOSUR (Southern Common Market, Argentina, Brazil, Paraguay, and Uruguay) may cause environmental degradation in these democracies via economics of scale and deforestation (e.g., Greenpeace European Unit, 2019). In fact, even political decision-makers in EU member states have questioned the trade agreement, given Brazilian president Jair Bolsonaro's inaction during the devastating wildfires in Latin America in 2019 (Borger et al., 2019; Sengupta, 2019). The Amazonian fires are a man-made disaster (Watts, 2019). Farmers and smallholders burn forest land for agriculture. In addition, land-grabbers burn trees. The deforestation in 2019 was far worse than in previous years. While there are multiple explanations for this development, the right-populist Bolsonaro government has reduced environmental regulations, cut the financial resources and staff of important environmental agencies, and questioned deforestation and climate change (Watts, 2019). Likewise, other right-populist political decision-makers and parties, including the Trump administration, have focused on economic growth and actively reduced and undermined state efforts to protect the environment. Second, based on the finding that civil rights lessen the negative effects of trade openness on climate performance, a decline in the rule of law is likely to contribute to global air pollution. It is therefore important to support both environmental protection and civil rights. Right-wing governments, like those in Brazil and the United States, undermine civil rights and environmental

protection. President Joel Bolsonaro cuts public support for indigenous groups and accepts land grabbing, which, together with deforestation, destroys their way of life. Accordingly, he does not accept the rule of law at the international level or environmental cooperation. The Brazilian government rejected the support of EU member states to tackle the wildfires. However, this book has also shown that foreign direct investment contributes via economic growth to global air pollution. A decline in the rule of law in countries such as Brazil may therefore have a positive effect for our atmosphere by reducing the economic activities of multinational corporations. To conclude, political decision-makers should address the environmental consequences of international trade and investment to tackle climate change.

References

Bang, Gury, Jon Hovi, and Tora Skodvin. 2016. The Paris Agreement: Short-term and long-term effectiveness. *Politics and Governance* 4(3):209-218.

Barrett, Scott. 2003. Environment and statecraft. The strategy of environment treaty-making. Oxford: Oxford University Press.

Borger, Julian, Jonathan Watts, and Tom Phillips. 2019. G7 leaders to hold emergency talks over Amazon wildfires crisis. https://www.theguardian.com/environment/2019/aug/23/ireland-could-oppose-trade-deal-brazil-fails-stop-amazon-fires-leo-varadkar. *The Guardian*. Accessed 7 Sep 2019.

Cao, Xun, and Aseem Prakash. 2012. Trade competition and environmental regulations: Domestic political constraints and issue visibility. *The Journal of Politics* 74(1):66–82.

Escher, Romy, and Melanie Walter-Rogg. 2018. Does the conceptualization and measurement of democracy quality matter in comparative climate policy research? *Politics and Governance* 6(1):117–144.

Frankel, Jeffrey A., and Andrew K. Rose. 2005. Is trade good or bad for the environment? Sorting out the causality. *Review of Economics and Statistics* 87(1):85–91.

Fukumi, Atsushi, and Shoji Nishijima. 2010. Institutional quality and foreign direct investment in Latin America and the Caribbean. *Applied Economics* 42: 1857-1864.

Gale, Fred. 2019. Sustainability. In *The Palgrave Handbook of Contemporary International Political Economy*, eds. Timothy M. Shaw, Laura C. Mahrenbach, Renu Modi, and Xu Yi-chong, 517-534. London: Palgrave Macmillan.

Greenpeace European Unit. 2019. EU-Mercosur deal trades in environmental destruction. Greenpeace. https://www.greenpeace.org/eu-unit/issues/democracy-europe/2122/eu-mercosur-environmental-destruction/. Accessed 15 Aug 2019.

Hanusch, Frederic. 2018. Democracy and climate change. London & New York: Routledge.

Jahn, Detlef. 2010. The veto player approach in macro-comparative politics: Concepts and measurement. In *Reform processes and policy change*, eds. Thomas König, Marc Debus, and George Tsebelis, 43–68. New York (NY) Springer.

Lockwood, Matthew. 2018. Right-wing populism and the climate change agenda: exploring the linkages. *Environmental Politics* 27(4):712–732.

Selin, Henrik, and Stacy D. VanDeveer. 2012. Federalism, multilevel governance, and climate change politics across the Atlantic. In *Comparative environmental politics. Theory, practice, and prospects*, eds. Paul F. Steinberg, and Stacy D. VanDeveer, 341–368. Cambridge (MA) & London: The MIT Press.

Sengupta, Kim. 2019. The Amazon burned - and put fire in the belly of Europe's climate crusade, 04.09.2019. https://www.independent.co.uk/news/world/europe/amazon-fires-brazil-bolsonaro-climate-change-macron-environment-a9092041.html. *The Independent*. Accessed 7 Sep 2019.

Spilker, Gabriele. 2013. Globalization, political institutions and the environment in developing countries. New York, London: Routledge.

Watts, Jonathan. 2019. Amazon fires: what is happening and is there anything we can do? Why people should be worried about the blazes and increased deforestation in Brazil. https://www.theguardian.com/environment/2019/aug/23/amazon-fires-what-is-happening-anything-we-can-do#. *The Guardian*. Accessed 8 Sep 2019.

Winslow, Margrethe. 2005. Is democracy good for the environment? *Journal of Environmental Planning and Management* 48(5):771–783.